DISEASES
OF THE
NAILS

(Third Edition)

DISEASES OF THE NAILS

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AMERICAN DERMATOLOGICAL ASSOCIATION, INC
THIS VOLUME IS
RESPECTFULLY DEDICATED

INTRODUCTION TO THE THIRD EDITION

The continued favor that the medical and allied professions have bestowed upon this monograph has been greatly appreciated A reprint of the second edition was necessary to meet the demand A third edition with the newest additions that have appeared in the medical literature, as well as our own observations and experience in the past years is here with presented It is hoped that it will be as useful to the medical students and practitioners as the former editions

We wish to express our deep appreciation of the work done and the interest shown in the publication of this volume by the publisher, Mr Charles C Thomas

V Pardo Castello, M.D
Osvaldo A Pardo, M D

INTRODUCTION TO THE SECOND EDITION

In this second edition of *Diseases of the Nails* I have tried to follow the same principles that inspired the first edition conciseness and comprehensiveness Several new illustrations have been added and sixty five new references to the literature analyzed I wish to express my deep appreciation of the cordial reception given to the first edition and I hope that this monograph will continue to serve its purpose

V PARDO-CASTELLO M D

INTRODUCTION TO THE FIRST EDITION

This monograph was conceived as a result of the difficulties encountered in properly labeling the majority of nail affections in a fairly large dermatological service and with the full realization that it can not be a complete and exhaustive study of the pathology of the nails The purpose in view is to supply to the English speaking physicians the widely scattered facts contained in the literature together with my own observations on the subject in a condensed and comprehensive manner

I hope these pages will be received in the same spirit that prompted their writing

V PARDO-CASTELLO M D

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I wish to express my deep appreciation to Dr Howard Fox for sponsoring this monograph, for reading the manuscript and making many valuable suggestions, and for his unfailing friendship and helpful encouragement

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Finally I wish to thank Mr Charles C Thomas, the publisher, for his deep interest and personal cooperation

V PARDO CASTELLO, M D

FOREWORD TO FIRST EDITION

In spite of the great frequency of nail disturbances, few physicians have much accurate knowledge concerning them Even the trained dermatologist is often at a loss to make a correct diagnosis of nail diseases While a comprehensive work on diseases of the nails has been written by a German author, very little has appeared in English on this subject English speaking physicians should therefore feel indebted to their Cuban colleague, Dr Pardo Castello, who has brought this subject to their attention in a concise and carefully written monograph The author, who has made a special study of the subject for years, shows his scientific training and powers of observation in this as in all of his publications The numerous illustrations and extensive bibliography add to the value of this most excellent treatise

HOWARD FOX, M D

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Chapter 1

ANATOMY AND HISTOLOGY OF THE NAILS

The nails are cutaneous appendages designed to protect the extremities of the fingers and toes from harmful external agents and particularly to protect the sense of touch, so delicate in the finger tips It is also possible that the vascular sinuses situated under the nails play an important rôle in the regulation of the peripheral circulation, though this is not at present definitely known The nails also play an important part in the act of prehension of small objects In lower animals the nails serve to support the body in loco motion and to protect the extremities against trauma and for these purposes they assume a more resistant form In some animals the nails serve as organs of defense or attack as in the felines birds of prey and others

Anatomically speaking the nails are similar to the epi dermis from which they spring, and like the epidermis they are formed by keratotic cells, intimately adherent to each other but retaining fragments of their nuclei These cells are in reality keratotic skeletons of epithelial cells of such compact nature that Ranvier and other histologists have thought them to be composed of a peculiar substance which has been named onychin ' This substance is very similar to keratin It is not affected by weak alkalies or weak acids and is not digested by pepsin and hydrochloric acid but it becomes dissociated and finally destroyed by strong alkalies

and strong acids The nail substance stains exactly as does the stratum corneum of the skin with hematoxylin safranin gentian violet picro carmin silver protein Masson tri chrome and others

The nail is formed in an epidermic invagination or nail fold situated on the dorsal aspect of the last phalanx of the fingers and toes which in certain respects corresponds to the hair root The nail fold is divided proximally by the nail root into a dorsal and a ventral aspects covered by the nail wall The thin membrane extending from the proximal nail wall over the nail plate is called the eponychium The nail bed comprises all the soft tissues beneath the nail plate



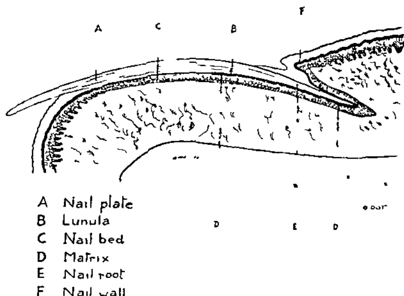
Fig 1 Epithelial bud beginning of the formation of the nail Note clear cells representing the ungual bed and beginning nail plate above (Section of the finger of a five month old fetus)

The nail matrix is the most important structure of the nail and extends from one lateral border of the nail plate to the other. It is composed of a basal layer of cuboidal cells and several rows of polygonal cells similar to those of the stratum malpighi and filled with numerous very fine granules of keratohyalin which gives them a peculiar white cloudy color The matrix is the main reproductive part of the nail, its cells growing distally and becoming gradually cornified The anterior part of the matrix may be seen through the posterior fifth of the nail plate as a convex, white, crescentic surface, which is called the lunula The white color is due to the fact that the nail cells have not become entirely cornified and still retain granules of keratohyalin Lewis (355) on the contrary has found no traces of keratohyalin granulations in this area Nevertheless Burrows (1) from his histologic studies concludes that the opacity of the lunula is not caused by any peculiarity of the structure of the nail or of its matrix but is the result of a reflection of light at the surface of the junction of the matrix and the connective tissue of the nail bed, the matrix not being adherent to the connective tissue underlying the lunula as it is elsewhere The size and shape of the lunulae vary in different individuals, well marked in some, it may be hidden under the posterior fold in others and in old persons, it is often diffuse and undefined In the Negro, the lunula is visible in the thumbs only, being absent or very small in the fingers, This, however, is not true of all persons having Negro blood the lunulae being usually well marked in most mulattoes Indians have, as a rule, well developed lunulae

In common language the nail is the hard plate which covers most of the dorsum of the last phalanx, but anatomically speaking the nail is composed of the nail plate

or nail proper, the nail bed which lies beneath it and the periungual tissues

The nail plate is oblong, laterally curved, with a longitudinal long axis in the fingers and a transverse axis in the toes The plate ends toward the tip of the finger in a free edge of grayish white or yellow color The proximal end called the root is covered by a fold of the epidermis, the nail wall already mentioned and is deeply embedded in the nail matrix with which it merges The nail plate rests

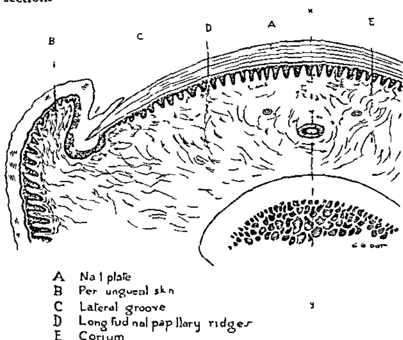


LONGITUDINAL SECTION OF THE NAIL

Fig 2

laterally on the nail grooves into which it fits as a watch glass does in its case The outer surface of the nail is smooth shiny and pinkish in color, the under surface presents numerous longitudinal parallel ridges which fit exactly into similar depressions of the subjacent nail bed, in such a

manner that when the nail is sectioned longitudinally these ridges are not apparent but show very clearly in transverse sections



CROSS SECTION OF THE NAIL

Fig 3

Barton L Lewis (355) histologic sectional and staining studies describe three different layers in the nail plate namely dorsal intermediate and ventral nail The dorsal nail layer originates from the proximal dorsal aspect of the nail fold by a process of first macrocytosis next nucle olysis and finally cell collapse which Lewis terms inflation deflation cycle The ventral aspect of the proximal nail fold also takes part in the formation of the dorsal nail up to some extent Lagermalm and co-workers have found

evidence of an epicuticle over the dorsal nail with the use of the electron microscope

The intermediate nail arises from the floor of the proximal nail fold by a process best termed by Lewis gradient para keratosis whereby the epidermal cells undergo progressive broadening and flattening with a prolonged retention of the nuclei From these studies there is some evidence that the dorsal and occasionally the intermediate nail take some *of their substances from keratinized material generated in* the lateral nail folds

The ventral nail is best studied in the fetus near term It arises usually from the nail bed underlying the distal one half to two-thirds of the roseate nail This term is introduced by Lewis to describe the portion of the nail bed between the distal portion of the lunula and the proximal margin of the whitish opacity at the free edge of the nail In the mature nail this nail component is generated by the inflation-deflation cycle At its proximal limits ventral nail generation is limited to the epidermal ribs which are the longitudinal elevations in the nail bed distally to the lunula The thickness ratio of the dorsal and ventral nail to the intermediate nail compares grossly with that of the thickness ratio of the glabrous epidermis to the dermis

The common borders between the dorsal and the inter mediate nail and the limit between the intermediate and the ventral nail are rich in polysaccharides

The stain technic which most strikingly delineates the three layers of the nail plate is that employing the silver protein modified after Bodian and Moskowitz which stains the intermediate nail layer in yellow brown and the dorsal and ventral nails in shades of blue black (Lewis)

The nail bed on which the nail plate rests presents an epithelial layer composed of cells similar to those of the matrix with which they are continuous but they are de

void of granules of keratohyalin and consequently do not seem to take a part in the production of the nail plate Under this epithelial layer there is a vascular and connective tissue structure corresponding to the corium, in which there may be seen numerous oblique and vertical fibrous bundles which bind the nail to the subjacent periosteum of the phalanx

The nail bed does not apparently take part in the production of the keratotic nail cells but undoubtedly plays an important rôle in the nutrition of the nail plate, for the latter becomes discolored, cloudy and distorted when separated from its bed by trauma or any other pathologic cause Walter Krautz (2) has proved that the nail plate and the nail bed grow together from the matrix outward If subungual hemorrhage occurs, it grows out with the nail, furthermore if a mark is made on the nail bed after surgical removal of the plate, this mark grows out ahead of the nail instead of being covered by it

When the nail plate becomes separated from its bed in pathological conditions, the epithelium of the bed acquires the property of producing corneous cells which however are not arranged to form a continous layer, but remain loose as irregularly inspissated masses When the nail is definitely lost, the nail bed is covered with granulating tissue which, in turn is covered by epidermis as in any other scar formation

The nail bed is irrigated by two arterial arches, which are in reality anastomoses between the two lateral arteries of the fingers or toes These arches are deeply situated in contact with the periosteum, one is parallel to the lunula, the other parallel to the free edge From these two arches, small, vertical branches extend upward and then spread into an elaborate capillary network, parallel to the surface of the nail

The circulation of the nail bed is highly important Occupying the greater part of the corium under the nail bed, there is a very elaborate network of capillaries of great complexity and abundance, and in some places there are true vascular sinuses surrounded by non striated muscular fibers and a very rich network of non medullated nerve fibers This

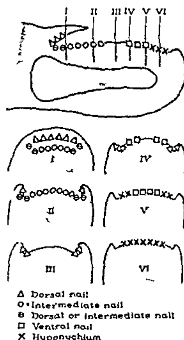


Fig 4 Sites of nail generation (Barton L Lewis)

vascular muscular nervous organization (glomus) is normally pulsating (ungual pulse) and is supposed to play an important part in the regulation of the blood pressure and in the normal blood supply of the extremities According to Masson (188) the glomi direct the course of the blood to the capillaries or to the veins and in this manner, regulate the peripheral circulation Their integrity is most important

and it has been demonstrated that their disappearance causes serious circulatory and trophic disturbances Physiologically speaking a glomus is a miniature heart

The innumerable capillaries of the upper nail bed end in the papillae and these seem to be well provided with blood vessels The capillaries are particularly abundant under the nail root for nutrition of the nail matrix

Truffi (149) studied the distribution of the blood and lymphatic vessels of the hairs and nails of the human fetus For the study of the blood vessels he used injections of carmin and gelatin He confirmed the anatomic descriptions of several authors who have studied this subject and he stressed the rich supply of blood vessels of the parts of the skin covered with hair For the study of the lymphatics Truffi used massive injections of Prussian blue The lymphatic vessels of the nail bed are more numerous than those of any other part of the skin they form a flat network and often end in loops The richest lymphatic supply is seen towards the free end of the nail where it joins the finger tip and where the papillae are more numerous This superficial network of lymphatics is joined to the deep lymphatic trunks by anastomotic rami

Lewis (355) has found a medium sized blood vessel connecting the nail fold with the distal interphalangeal joint This anatomic relation is of value in considering the close association between joint and nail diseases

The nerves of the nail bed are also numerous and large nervous trunks are seen in the adventitia of the large vessels of the glomi as well as in the cellular tissue Numerous Vater Paccini corpuscles are seen deep in the corium and these corpuscles are huge toward the tip of the finger Nervous fibrils are also seen in the papillae where they end or perhaps pass into the intercellular spaces of the epithelium

Herrera (242) studying the innervation of the nail in a

case of supernumerary fingers, found a very rich network of medullated fibers ending in free, lanceolated or spear-shaped points Some of these nerve endings terminate among the epithelial cells of the nail bed, others, in the connective tissue beneath, and still others on the epithelial basal layer as small expansions



Fig 5 Photomicrograph of cross section of the nail at the root showing papilla and blood vessels

No corpuscles of Paccini and of Meisner were found in the tissue examined by Herrera In the nail bed, fan like networks of nerve fibrils are very numerous, the individual fibers ending in thick expansions in contact with the epithelium or in fine, tortuous fibrils spreading throughout the connective tissue just beneath the nail, in the form of small brushes The latter are more numerous toward the

outer zones of the nail bed become thicker and are disposed parallel to the surface and sometimes curve down themselves At the edge of the nail bed towards the free edge corpuscles of Meisner are again apparent

These nervous terminations are well seen in sections treated with silver stains prepared by Dr P M Leon of the Department of Pathology of the University of Havana

The nail plate grows continuously and under normal conditions persists throughout life If destroyed by trauma or when it falls off it is usually replaced unless the matrix has been destroyed In this case it is permanently lost and substituted by the stratum corneum of the epidermis which grows over the nail bed from both the lateral grooves and from the posterior nail wall If the matrix has been damaged but not destroyed the nail grows in a distorted manner or is split

The nail grows from the matrix to the free edge in from 130 to 160 days this growth being much faster in the fingers than in the toes and faster in summer than in winter The nails also grow faster in children than in adults Clark and Buxton (204) have measured very carefully the rate of nail growth in different individuals under different conditions and found that the average growth of the nails is about 3 mm per month but in nail biters the growth is usually much more rapid According to Clark and Buxton the nail of the middle finger grows more rapidly than the rest and that of the little finger slowest there are no sex variations and finally it seems that the rate of growth is slow during early infancy attaining the adult standard by the age of three while in old age the growth slows again

According to Wigand (205) in right handed persons the nails grow faster on the right side than on the left—1 2 mm in ten days as against 1 1 mm —and the nails of the thumb and small finger grow more slowly than others

Bennett (356) measured the growth of his own finger nails for a ten year time period observing an average daily growth for the whole period of 0 119 mm daily, with extremes of 0 112 mm to 0 132 mm There were a few unaccountable spurts and lags in growth No seasonal, occupational or geographical variations were noted in the growth rate of the finger nails, but there was a slight slowing in growth over the ten years observation period apparently as part of the aging process The rate of growth of the toe nails was about one-quarter to one third as fast as the growth of the finger nails

Chemical Composition of the Nails The chemical composition of the nail substance is of importance in health and disease Keratin is the most important substance entering into its composition Keratin is an albuminoid characterized by its high sulphur content which according to Klauder varies around 3 2 per cent and may be as high as 5 per cent according to other investigators Sulphur in the nail is in the form of the amino acid cystine Sullivan and Hess consider 3 2 per cent of sulfur as normal for the nails which is equivalent to 12 per cent of cystine The normal sulphur content may be greatly decreased in atrophic or dystrophic conditions This is of importance in view of the studies of J V Klauder (153) concerning the treatment of nail dystrophies with hydrolized wool The determination of the sulphur content of the nails may result in favorable therapeutic indications

Block (360) studying the amino acid composition of the finger nails gives the following figures nitrogen 14 9 per cent sulfur 3 8 per cent histidine 0 5 per cent lysine 2 6 per cent arginine 8 5 per cent cystine 12 0 per cent tyrosine 3 0 per cent tryptophane 1 1 per cent and phenylalanine 2 5 per cent

Lipids in the nails are in the form of cholesterin about

14 22% probably the result of cell metabolism Cholesterin in the nails helps to maintain the elasticity and normal cohesion of the nail cells When cholesterin is lacking due to local processes or to disturbed systemic conditions the nails become scaly dry brittle and their cells separate easily

The nails contain also about 14 per cent of water cal cium phosphate carbonates and small amounts of arsenic (17 2 thousands of a milligram per cent according to Billeter and Murfurt quoted by Heller)

Kile (358) has found no difference in the calcium phos phorous and total ash content of nail clippings from patients with hard and brittle nails The calcium and phosphorus content of nails callus and cow s hoof were similar A large sample of nail clippings pooled from a group of Cuban patients with various skin diseases had much higher calcium content than any other studied C Mattei and others (359) have found that calcium content increases with age in human nails In general the increase starts after the age of thirty eight Goldblum (357) divides the fourteen metals investi gated from the nails skin and hair by spectographic analysis into three groups as follows calcium and phosphorus metals known to be associated with some enzymatic process and inert metals which are not known to have any metabolic normal function Calcium is higher in the nails than in the skin or hair while phosphorus is higher in the skin than in the nails The metals associated with enzymes (zinc mag nesium copper iron and manganese) which are in greatest concentration in the skin are also in greatest amounts in the nails with the exception of the magnesium and copper content of the hair Among the inert metals silver is found in higher amounts in nails than the others

Capillaroscopy This investigative procedure has been dis appointing in dermatology There are no typical capillaro-scopic pictures corresponding to definite dermatoses In

diseases of the nails the procedure has not been of practical use in spite of the fact that the nail wall covering the root has been the favorite site of most investigators in these studies The method has been more useful in the study of the action of certain drugs in the capillary circulation such as adrenalin and pituitrin Thus Scolari (144) has been able to demonstrate in the nail wall that the injection of adrenalin and pituitrin does not cause contraction of the capillaries but rather a stasis of blood plasma with absolute disappearance of the red cells from the periphery These studies of Scolari Muller Jungersen Friedlander Castelloti Lewis and many others may have great importance in the explanation of such phenomena as urticaria the erythemas cutaneous sensitization Raynaud s disease and other peripheral vascular disturbances

Chapter II

PATHOLOGY OF THE NAILS

Affections of the nails are very common Of 464 patients taken at random from those attending our service of Dermatology and Syphilology, 192 or 41 37 per cent had one or more abnormal nails Some of these cases were minor disturbances of the nails or of the surrounding tissues, such as leukonychia and onychophagia, but others were important conditions such as syphilis, psoriasis and eczema In private practice the proportion of nail disturbance is not so high

The nails are affected by the same conditions which attack the general surface of the skin Many cutaneous diseases have ungual symptoms which are however rarely characteristic General systemic diseases such as syphilis, the endocrine disturbances, the anemias and others may also present important nail changes On the other hand the nails, being well differentiated structures, may suffer from diseases which are peculiar to them including infections with bacteria and fungi, *tumors, and various other inflammatory conditions* Many nail affections are congenital Frequently diseases of the nails cannot be ascribed to any general or local cause, particularly in the case of the large class of nail dystrophies

As a rule one or more nails are affected, but rarely all nails of the fingers and toes may be abnormal In congenital conditions all nails are usually attacked Some conditions, such as onychogryphosis affect almost exclusively the toes and others, such as leukonychia, almost exclusively the fingers

The ungual manifestations of many diseases are peculiar due to the structure of the nail plate, and in the absence of other general or cutaneous manifestations, are very difficult or even impossible to diagnose Thus eczema, psoriasis, dermatitis exfoliativa, and ichthyosis affect the nails in much the same manner and the diagnosis depends on the recognition of the cutaneous condition Laboratory examinations are indispensable in the correct interpretation of infections of the nails either by bacteria or fungi On the other hand, the same disturbance of nail growth may be due to different causes and this is especially true of the many dystrophies of the nails A complete examination of the patient may be necessary for a correct diagnosis

To understand the lesions of the nail plate and of the nail bed it is necessary to remember that both the plate and the bed of the nail grow from a common source, the nail matrix When the matrix is affected, either the plate alone or both the plate and the bed suffer Continuous irritation of the nail matrix may produce exaggerated function with the formation of hyperkeratosis sub ungualis or onychauxis Cessation of the function of the matrix or irregularities in its functional tempo, lead to atrophy and dystrophy

It is very difficult to study the histopathology of ungual and peri ungual lesions as it is almost impossible to obtain permission for biopsies Even when the patient consents to the removal of a small piece of tissue for diagnosis, the results are not satisfactory, for the complete examination of the nail, its matrix and its bed requires the removal of the entire phalanx followed by decalcification of the bone In a few cases we have been able to obtain specimens from the cadaver and the results of these few observations have led to believe that in most nail dystrophies, the matrix increase

or decrease in function is responsible for the clinical symptoms The matrix in exaggerated function produces excessive nail tissue, the matrix in diminished activity gives rise to irregular formation of nail substance and possibly to loss of normal correlation between the growth of the nail and that of its bed The formation of a corneous layer between the nail and its bed is the result of distorted or excessive function of the matrix, which results in the same changes seen in parakeratosis and hyperkeratosis of the skin Separation of the nail plate from its bed causes the latter to grow into a corneous mass, which clinically constitutes the so called hyperkeratosis sub unguealis Here as elsewhere the intimate mechanism of this process is unknown When excessive function of the matrix occurs and the correlation between the growth of the plate and that of the bed is maintained, the result is hypertrophy of the nail organ in toto (pachyonychia)

CLASSIFICATION OF NAIL AFFECTIONS

Affections of the nails may be grouped in four chapters

I Affections peculiar to the nails

II Onychodystrophies

III Ungual manifestations of dermatoses and of systemic diseases

IV Congenital affections of the nails

I Affections peculiar to the nails

1 Paronychia and onychia
2 Onychomycosis
3 Unguis incarnatus (ingrowing toe nail)
4 Pterygium
5 Hangnails
6 Hemorrhage

7 Newgrowths chondroma and exostoses
epithelioma
melanoma
sarcoma
granuloma pyogenicum
synovial cyst
verruca vulgaris
fibroma
clavus
angioma
glomus tumoralis sub unguahs

II Onychodystrophies

1 Onychauxis and onychogryphosis
2 Hyperkeratosis sub unguahs
3 Onychatrophia
4 Hapalonychia
5 Koilonychia
6 Platonychia
7 Onychoschizia
8 Onycholysis
9 Onychomadesis
10 Leukonychia
11 Onychorrhexis
12 Beau s lines
13 Dystrophia mediana canaliformis
14 Pigmentations
15 Onychophagia
16 Usure des Ongles
17 Hippocratic nails
18 Fragilitas Unguium

III Ungual manifestations of dermatoses and of systemic diseases

1 Psoriasis
2 Eczema

3 Lichen planus
4 Dermatitis exfoliativa
5 Pityriasis rubra pilaris
6 Ichthyosis
7 Alopecia areata
8 Acanthosis nigricans
9 Darier's disease
10 Radiodermatitis
11 Keratoderma palmare et plantare
12 Pemphigus and dermatitis herpetiformis
13 Epidermolysis bullosa
14 Dermatitis repens
15 Scleroderma
16 Poikiloderma atrophicans vasculare
17 Elephantiasis
18 Syphilis
19 Leprosy
20 Lupus erythematosus
21 Tuberculosis lupus vulgaris, tuberculosis verru cosa cutis, tuberculous paronychia
22 Infectious diseases pulmonary tuberculosis, typhoid fever, eruptive fevers, rheumatism, diph theria, puerperal fever and others
23 Nervous diseases
24 Gangrene of the extremities
25 Achlorhydric anemia
26 Avitaminosis
27 Dysendocrinias

IV Congenital affections of the nails
1 Congenital ectodermal defect
2 Anonychia
3 Polydactylia and syndactilia
4 Micronychia and macronychia
5 Pachyonychia congenita

This classification has as many defects as any other dermatological attempt to group in a comprehensive and scientific manner a number of conditions with diverse or unknown etiology and with indefinite histopathologic structure It is merely a classification for purposes of practical arrangement

In a final addendum we have grouped those occupations in which nail affections seem to be more common and a resumé of the nail symptoms due to the most common poisons This has a certain importance from a medico legal point of view

In order to give an approximate idea of the frequency with which nail affections are encountered in daily practice we have listed in the following table those cases seen by us personally during a period of six months

Nail Affection	Location		Race		Sex		Total
	Fing	Toes	B	C	M	F	
Onychomycosis	44	50	64	30	68	26	94
Paronychia (staphylococci)	32	4	20	16	14	22	36
Onychia traumatica	12	2	4	10	10	4	14
Unguis incarnatus	0	4	4	0	2	2	4
Pterygium	0	2	0	2	2	0	2
Panaritium (periungual)	6	0	4	2	4	2	6
Hangnails	6	0	4	2	4	2	6
Hematoma	4	4	6	2	6	2	8
Epithelioma	2	0	1	1	1	1	2
Bowen's disease	1	0	1	0	0	1	1
Melanoma	0	1	1	0	1	0	1
Fibroma	2	1	3	0	1	2	3
Verruca vulgaris	4	0	4	0	2	2	4
Angioma	1	1	2	0	1	1	2
Glomus tumoralis	1	0	1	0	0	1	1
Onychatrophia	2	17	6	13	10	9	19
Onychauxis and Onychogryphosis	4	77	63	18	73	8	81
Hapalonychia	2	1	2	1	3	0	3
Koilonychia	1	0	1	0	1	0	1
Onychoschizia	1	0	1	0	0	1	1
Onycholysis	6	0	4	2	6	0	6
Onychomadesis	0	1	1	0	0	1	1
Leukonychia striata	36	0	34	2	12	24	36
Leukonychia totalis	1	0	0	1	1	0	1
Onychorrhexis	6	9	4	11	9	6	15
Beau's lines	4	15	15	4	6	13	19
Dystrophia mediana canaliformis	1	0	1	0	0	1	1
Pigmentations	11	0	1	10	8	3	11
Onychophagia	18	0	6	12	12	6	18
Usure des ongles	3	0	1	2	3	0	3
Hippocratic nails	6	6	2	4	5	1	6
Psoriasis	28	4	20	8	20	8	28
Eczema	6	18	14	10	16	8	24
Lichen planus	1	1	0	1	0	1	1
Dermatitis arsenicalis	2	2	1	1	1	1	2
Dermatitis exfoliativa	1	0	1	0	1	0	1
Radiodermatitis	2	0	2	0	2	0	2
Keratoderma punctatum	1	0	0	1	1	0	1
Epidermolysis bullosa	2	2	1	1	2	0	3
Dermatitis repens	2	1	2	1	1	2	3
Scleroderma	1	0	0	1	0	1	1
Symmetric gangrene	0	3	2	1	3	0	3
Elephantiasis	0	2	2	0	1	1	2
Syphilis	10	6	13	3	11	5	16
Leprosy	[illegible]	5	10	8	16	2	18
Lupus vulgaris	1	0	1	0	1	0	1
Verruca necrogenica	2	0	2	0	2	0	2
Anemia achlorhydrica	1	0	1	0	1	0	1
Synammosis (?)	1	0	0	1	0	1	1
Dysendocrinias	1	1	0	2	0	2	2
Congenital ectodermal defect	1	1	0	1	1	0	1
Micronychia	1	0	1	0	0	1	1

Chapter III

AFFECTIONS PECULIAR TO THE NAILS

PARONYCHIA AND ONYCHIA

Paronychia is an inflammation of the tissues surrounding the nail plate Onychia is an inflammation of the nail plate Both conditions are usually coexistent and as a general rule onychia is the result of a previous paronychia and a consequence of the nutritional disturbances caused by the peri ungual inflammation in the nail matrix

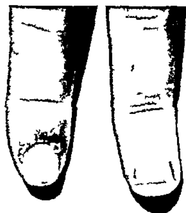


Fig 6 Peri ungual staphylococcic panaritium

The most frequent cause of onychia is trauma which results in inflammation of the matrix with subsequent loss of the nail If the matrix is not permanently injured the nail

begins to regrow at once and reaches the free edge in about five months If the matrix becomes chronically inflamed the resulting nail plate is discolored distorted and cracked Onychia and paronychia may be the result of foreign bodies under the nail, such as vegetable thorns, wood splinters, or of parasites such as the acarus scabiei and the pulex penetrans Paronychia is more often due to direct infection with staphylococci, streptococci and colon bacilli

Onychia as an occupational disease has not received enough attention, according to Haldin Davis (154) These cases are found among those whose hands are immersed in water for long periods, among workers in alkalies and calcium chloride



Fig 7 Abscess of the nail wall The nail root may be seen through the aperture

The skin about the nails and particularly the lateral grooves and the posterior fold appear red edematous and painful There is always more or less exudation of pus *from the periphery of the nail and* even from under the nail plate The nail loses its natural gloss becomes opaque and

dark presents irregularities and finally becomes loose beginning at the root or the borders At times surgical removal is necessary When the nail plate has fallen off or has been removed the nail bed appears red and inflamed with abundant exudation and is exquisitely tender

Sometimes the inflammation is localized at one side of the nail or at the root and then pus collects with the formation of an abscess (panaritium) or a cellulitis ensues with or without ascending lymphangitis These lesions are extremely painful sometimes deeply situated and require the administration of antibiotics and/or surgical intervention Often they result in permanent deformities of the nail or even in its total loss This type of paronychia is always due to infection with staphylococci or streptococci or both

In chronic paronychia due to staphylococci the peri ungual inflammation is milder of long duration and the pain is very slight or almost absent These chronic paronychias begin in the lateral grooves or the posterior fold and affect one or several fingers Staphylococcus pyogenes albus is constantly recovered from the pus Cooks maids laundresses bar tenders and others who have their hands in water for hours are frequently affected In later years with the introduction in the market of the new so called heavy duty or light duty household beads powders or liquid synthetic detergents combined with the more participation of the middle class housewives in the handling of the daily house cleaning laundering dishwashing the incidence of mild to moderate paronychial inflammation of the nails has concurrently increased Infected manicuring instruments may be responsible in some cases In some cases simple inflammatory paronychia may be an occupational condition due to irritating substances employed in the industries Patients may be entitled to compensation *Schwartz (206) believes* that hypersensitivity to citrus oils and juices may be the

cause of paronychia observed among canners of these fruits This chronic type may last for months or years the nail plate finally becoming deformed black or greenish but rarely falling off The digits more frequently affected are the thumbs and one or two fingers of both hands and in rare cases all digits may be affected The condition is very rare in the toes and in this location is usually a complication of an ingrowing toe nail

The differential diagnosis must be made from similar lesions produced by yeasts or monilia by microscopic examination of the exudate and by cultures

In impetigo contagiosa lesions may appear on the nail wall in the form of superficial pustular or crusted paronychia The diagnosis is obvious since many other lesions are present on the skin

In scabies pustular lesions may be present on the nail wall or on the juncture of the nail plate and the finger tip Here the presence of other lesions of scabies and the subjective sensations are diagnostic

Paronychia due to the presence of chiggers (Tunga penetrans) is common in certain rural districts The most common location is under the root and under the free edge a pocket of pus collects in these locations The lesions are very painful Removal with the point of a needle requires experience followed by the administration of antibiotics intramuscularly or by mouth and the local application of turpentine or mercurial ointments

Hollander (3) Jaubert (4) and Artom (5) have reported cases of paronychia and onychia due to colon bacilli In these cases the possibility of infection of the nails from scratching in pruritus and must be borne in mind

Haden and Jordan (6) have reported two cases in which the inflammatory paronychia was due to focal infection in the teeth The germ obtained from the abscessed teeth injected into rabbits produced peri ungual inflammation

Stokes (7) has reported a case of paronychia due to tubercle bacillus in a woman aged twenty five The thumb and three other fingers were affected There was no ulceration or exudation and the lesions of corneous, translucent aspect, caused elevation and deformity of the nail plates This was the first symptom of a generalized tuberculosis which ended the life of the patient three years later

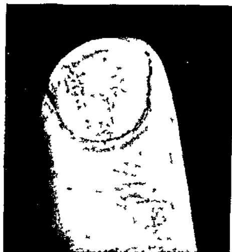


Fig 8 Onychia punctata and striata probably due to repeated small trauma in a dentist The condition affected the first two nails of the right hand and was attributed to the use of the dental drill (Courtesy of Dr Edward F Corson)

Benedect (244) reports a case of loosened nails over deep red and discharging nail beds in a boy of seventeen with hereditary dystrophies of the nails and hair The disease affected five fingers and the duration was two years A pure culture of fuso spirochetes was obtained from the pus Intra venous administration and local application of neo arsphena mine was unsuccessful Removal of the nails by surgical means and antiseptic treatment effected a cure

Gill (245) has reported an epidemic of cutaneous diphtheria occurring in Palestine and in one case there was paronychia the patient requiring hospitalization and repeated injections of diphtheria antitoxin For these cases Sertoli (361) associates the administration of chloramphenicol in capsules by mouth and the application of a chloramphenicol ointment

Infection by the virus of herpes simplex has been reported more frequently in recent years Ruiter quoted by Sertoli reports a case in which aphtous stomatitis was associated with herpetic paronychia proved by animal inoculation Kaposi s varicelliform eruption has been ascribed to this virus

In our experience the intramuscular administration of human or animal immuno globulin in repeated doses in the treatment of relapsing herpes simplex has been successful in many cases

Paronychia leishmaniotica has been reported by Costa (246) in a Brazilian Negro farmer Around the nail of the right thumb there was a painless ulcer with irregular floor covered with sero purulent secretion the edges were not raised and there was a peripheral cyanotic halo Leishmania brasiliensis was demonstrated microscopically Serological reactions for syphilis were negative The only effective treatment for American mucocutaneous leishmaniasis is the intravenous injection of tartar emetic or stilbamidine Schmidt (454) has found that the local application of a 5 per cent tartar emetic ointment in very early lesions has proved curative in many instances

Goldman and Fox (363) and Moore and Marcus (362) have implicated pseudomona aeruginosa as the cause of green blacknails after culturing the organism from nail scrapings This green black discoloration of the nail plate was atributed by these authors to the diffusion into the nail

plate of pigment produced by the growth of pseudomona aeruginosa as a secondary invader in some cases of par onychial infection

Bauer and others (364) report four cases in which it was difficult to relegate the role of pseudomona aeruginosa to that of a secondary invader of the nail plate The infection began about the nail as onychia in all cases The belief that the green black discoloration is due to the growth of the organism within the nail plate was substantiated by the observation of normal nail clippings turning blue green or blue black after planted in pseudomona aeruginosa culture The most effective therapeutic agent as referred by Bauer (364) and others appeared to be cool soaks consisting of 0 1 per cent polymyxin sulfate in 1 0 per cent acetic acid followed by a 2 0 per cent solution of methylrosaniline

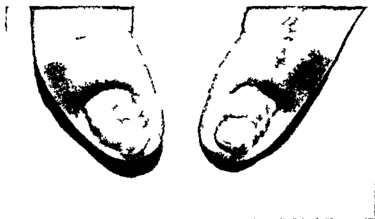


Fig 9 Staphylococc c paronych a and chron c onych a in a cook

Some cases may be impossible to classify etiologically Thus Bulkley (8) recorded a case of a woman aged thirty two who had lost all her finger nails except two as a result of chronic paronychia of five years duration Pustular lesions

recurred incessantly and proved to be bacteriologically sterile MacKee (9) has reported the case of a child who suffered from a recurrent pustular paronychia of practically all fingers with loss of the nail plates The condition improved after curetting but relapses always occurred In this case the Wassermann test was negative and no organisms could be found in the pus Vaccines, roentgen rays and local antiseptics were tried without success the etiology remaining unknown

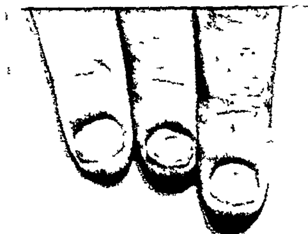


Fig 10 Staphylococcic paronychia and onychia in a houseworker

Morrow and Lee (10) in a study of sixteen cases of paronychia found fourteen of the chronic type and two of the acute type, all of them caused by staphylococcus pyogenes albus Of these cases twelve were in women and four in men and in three of them the nail was lost In fourteen of these cases paronychia was the only symptom present and in two there were manifestations of pyoderma elsewhere on the skin

Of 485 cases of nail affections studied by White (11) sixty-four or over 13 per cent were cases of paronychia

Siler (243) reports among the infection of the upper extremities 14 6 per cent of cases with paronychia and 8 8 per cent of subungual abscesses He states that subungual abscesses are the result of trauma and foreign bodies, and especially of the attempts on the part of the patient to remove them

In our experience nearly 11 per cent of all nail affections fall under the caption of traumatic and bacterial onychia and paronychia This figure corresponds closely with that of White

The treatment of chronic cases is at times unsuccessful Good results are obtained by local daily applications of 5 per cent chrysarobin in chloroform as recommended by Morrow and Lee (12) Excellent and quick results are often obtained with the application of ointments and lotions containing antibiotics combined with corticoesteroids or crystalline trypsin solution or ointment Layus (199) uses potassium permanganate, 0 03 gm in vaselin, 30 gm in all forms of paronychia

Hellier (365) has found chronic paronychia as a frequent nail disorder among middleage housewives and servants Candida fungi may be found in scrapings from the nail folds, but to the author it is uncertain whether Candida is a primary or a secondary invader For Hellier, infection is the usual cause of this nail disease He recommends for local treatment sterilization of the pocket under the nail by pushing a whisp of cotton soaked in pure phenol for about a minute once a week and the daily application at nights of an antiseptic solution of 0 5 per cent bichloride of mercury and 0 5 per cent brilliant green in alcohol A plastic seal over the nail fold helps to prevent recurrences

In some cases the administration of antibiotics, superficial x ray therapy and the local application of Vioform may be necessary to effect cure

In cases due to colon bacilli, autogenous vaccines may be successful Antibacterial tinctures such as Benzalkonium Chloride U S P in a 1 2,000 to 1 10,000 solution (Zephiran Chloride), Mercocresols N N R in a 1 2 to 1 20 dilutions (Mercresin), Thimerosal N F in a 1 1,00 solution (Merthiolate), Benzethonium Chloride U S P in a 1 500 to 1 1,000 solution (Phemerol Chloride) and others are slowly replacing silver nitrate, gentian violet, and acriflavin solutions due to their more esthetic properties, giving in many cases good therapeutic results

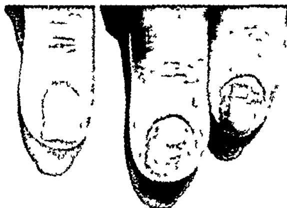


Fig 11 Staphylococcic paronychia and onychia. These lesions are very similar to those produced by monilia and the diagnosis rests on the microscopical examination and the cultures

In the majority of cases the patients must be warned against keeping the hands wet and in cooks, laundresses and bar tenders a change of occupation may be necessary if permanent results are to be obtained

Good results may be obtained with the use of cotton lined rubber gloves silicone and silicates protective ointments Hollis (366) has used a nail polish sealer which acts as a somewhat artificial cuticle to prevent water and various foreign materials from getting under the unattached nail fold in chronic paronychia The sealer is applied in the morning left on until bed time, when it is removed with acetone Medication is then applied in the nail fold during the night

In acute cases antibiotic administration with wet dressings of a mild antiseptic solution as hot as can be borne are indicated, followed by surgical incision if pus collects

In traumatic cases an antiseptic dressing is all that is necessary unless infection occurs, in which case the lesions should be treated as any other infected wound To prevent infection the injured nail should be thoroughly swabbed with tincture of iodine immediately after the accident and even when the nail has been torn off this procedure scarcely increases the pain and is very effective

Bacitracin, neomycin and other antibiotics with corticoesteroid ointments, as well as penicillin intramuscularly, orally administered tetracycline hydrochloride and similars may be indicated in cases of acute paronychia when cellulitis threatens and to prevent infection in traumatic conditions

Removal of the nail plate or at least of a V shaped piece may be necessary in subungual abscesses, to insure proper drainage

When as the result of trauma of the matrix the nail remains split in two as is often the case, Carter's treatment may be attempted Carter (13) trephined small openings on the opposite sides of the split and using Bauer and Black 000 dermal suture brought the two parts of the nail together Healing took place in about six weeks and the nail continued to grow normally It is doubtful if this treatment would

succeed in cases where the matrix has been permanently injured MacLean (207) advises the following procedure for split nails celluloid dissolved in amyl acetate is painted on the nail Several coats are applied, each coat being allowed to dry before the succeeding coats are used One treatment will last two or three weeks as a rule A convenient and cheap source of celluloid is old unbreakable watch crystals which jewelers discard One small crystal, dissolved in about 20 cc of amyl acetate makes a solution of about the right consistency



Fig 12 Loss of the nail due to staphylococcic infection

A peculiar type of inflammatory paronychia is that observed in small children on one or more fingers rarely on the toes The lesions are dry and scaly the inflammation being very slight As a rule the condition begins on the anterior end of the nail fold at the point where the nail joins the finger tip, in the form of slight redness and scaling The corneous layer becomes thickened and a certain amount of loose material accumulates under the free edge of the

Onychomycoses may be divided into three groups
1. Onychia due to dermatophytes
2 Onychia due to favus
3 Onychia and paronychia due to monilia and yeasts

These groups differ not only in their etiology but also in their clinical characteristics and it is usually possible with a certain degree of accuracy to ascertain to which group a given case belongs

Onychia due to Dermatophytes Onychia due to derma tophytes is always dry and almost never accompanied by paronychia It affects one or several nails but rarely all nails of fingers and toes

The diseased nail is dry, lusterless and squamous, having lost all or the greater part of its external layer of cells It often shows longitudinal striations and a worm eaten appearance or presents heaped up flakes This peculiar destruction

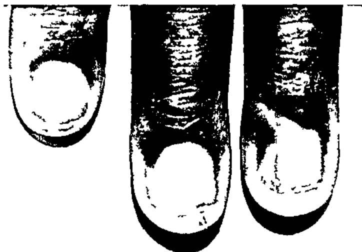


Fig 14 Onychia traumatica Longitudinal ridge due to injury of the matrix

may affect the entire thickness of the nail and in this case the striations may resemble those seen in the cross or oblique section of bamboo It is the nail en moelle de jonc of the French The nail may be partially separated from its bed raised by accumulations of horny material underneath and this separation of the nail progresses as does the disease always from the free edge to the root Rarely the nail is entirely lost but rather becomes wasted until finally reduced to a small dry discolored striated stump situated near the nail wall at the root

Alkiewicz (334) reports as a pathognomonic sign of onychomycosis a transverse network arranged in parallel white lines across the plate of the affected nails The network according to Alkiewicz consists of tunnels formed between the cells filled with air and often containing mycelia or spores these tunnels are 10 to 20 micra in width To observe this sign it is necessary to use a drop of cedar oil on the nail plate and after a few minutes examine it with a magnifying glass This sign Alkiewicz says is not observed in all cases of onychomycosis

In the experience of the authors of this book such phenomenon may also be observed in psoriasis and in several of the nail dystrophies and can not be considered pathognomonic of onychomycosis

White and Laipply (383) claim that microscopic findings in histopathologic studies of onychomycosis and psoriasis present a rather typical picture In psoriasis the changes include increased thickness of the nail plate groups of nuclei cystic spaces in subungual keratin In fungous infections the changes are similar except that the fungi can usually be demonstrated and the groups of nuclei and cystic spaces in the subungual layer are less prominent

Microscopic examination of shavings from these nails soaked in 40 per cent caustic potash solution shows mycelial

threads more or less abundantly, which are highly refractive in contrast with the opaque cellular background This examination should be made after thirty or forty minutes and with the high power dry objective We do not recommend heating the specimen, because it does not offer any advantage It often destroys the cells and the mycelium becomes separated Achten (393) prepares nail scrapings with

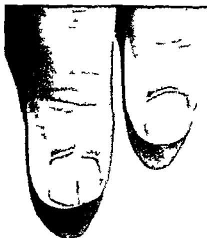


Fig 15 Split nail after onychia traumatica due to permanent injury of the matrix

0 1 per cent aminol (a cationic detergent) and 0 2 per cent basic fuchsin No diagnosis should be made without the microscopic proof of the existence of the parasite We have often heard of spores having been found in the nails, but in our opinion the diagnosis should be based on the presence of mycelial threads, because in fresh preparations there are innumerable round bodies which represent fragments of cells, droplets of fat and grains of foreign substances which are often mistaken for spores Sometimes the outlines of the cells may look like filaments but they are not septate nor branched and on moving the micrometric screw the oval

or rounded periphery may be seen In selecting scrapings for microscopical diagnosis Epstein (247) recommends the use of an electric drill such as has been devised by Kile and Welsh (248) to shave off the surface of the nail and to collect the diseased nail dust on a slide Kurtin and Yonteff (326) also advise the use of an electric drill to direct the stream of nail dust into the culture tube, insuring a higher percentage of positives A common penknife, a blunt bistouri or a piece of sharp glass may serve the same purpose

Care should be taken to obtain material from the deeper portions of the infected nail, because the surface is usually contaminated with saprophytes Lewis (208) has rightly called attention to this technical detail, which is of importance in obtaining pure cultures

Cotton blue lactophenol has been used successfully to stain fresh preparations of fungi in skin and nail scrapings This method was first employed by Swartz and Connant (250) following Langeron's method for dry specimens The best technic *seems to be that of Bernhardt (249)*

The cotton blue lactophenol formula is the following

℞

Lactic acid	10 0 cc
Phenol crystals	10 0 gms
Glycerin	20 0 cc
Distilled water	10 0 cc
Mix and add	
Cotton blue (C4B Poirier)	0.25 gms

The stain is allowed to sip under the coverslip, washing out the alkali used for the softening of the specimen until a uniform blue color is obtained The overflowing solutions are taken up with a piece of blotting paper

Lately new technics are being introduced for contrast stain of fungi in the nails among which is worth of mentioning that of Swartz and Coolidge (369)

Cultures of ringworm of the nails are of value only when mycelium has been found in the scrapings or shavings for a positive culture may be the result of the presence on or under the nail of saprophytes which are harmless especially in the toes Nevertheless, aspergilli and penicillia and other fungi which are apparently saprophytic moulds may produce nail lesions and this has been my experience in a number of cases These moulds grow very easily in shoe leather and contamination of the toe nails is possible from the shoes

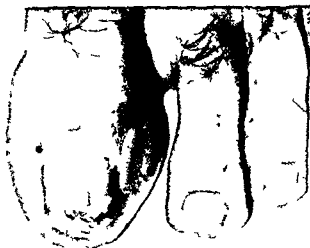


Fig 16 Onychomycosis due to a penicillium Beginning lesion

Samples of thirty seven different manufactured leathers planted in Sabouraud s agar gave positive cultures of four different varieties of fungi which were apparently saprophytic In at least two cases of ringworm of the nails in which mycelium was found in the nail substance—not merely on the surface—green penicillia seemed to be the etiologic agent

We merely suggest the possibility that shoe leather may be the source of contagion in some cases Jamieson and McCrea (191) have recovered pathogenic fungi from shoes worn by infected individuals thus demonstrating that shoes may be the source of repeated reinfections in these patients Barberian (209) has been able to cultivate Trichophyton interdigitale on material used as inner lining for shoes and on material used for inner soles Thus it seems that shoes are a constant source of reinfection in dermatophytosis



Fig 17 Onychomycosis Superficial onychia with abundant desquamation

Raubitschek and Maoz (370) induced invasion of nail clippings in vitro by certain dermatophytes by the use of continuous shake-culture technic The damage to the nail produced by the growth of the fungi seemed to the authors to be due more to mechanical than to chemical action of the fungus within the nail plate

Onychomycosis due to fungi which were formerly considered non pathogenic has been proved by many observers Rockwood (14) isolated from forty four suspected nails penicillium in seven cases aspergillus in seven cases epidermophyton in one case scopulariopsis in one case acromoniella

in one case and in others brown colonies which were not identified This series of 400 cultures suggests according to Rockwood 1) the probability that all so-called fungus nails are due to a variety of fungi and not wholly to epidermophyton or trichophyton interdigitale 2) the possibility that the nails may not be a source of epidermophyton or trichophyton infection and that the interdigital infection may be due to other fungi

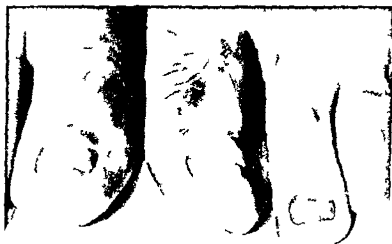


Fig 18 Onychomycosis Typical reedy worm eaten appearance

Weidman (15) isolated Penicillium brevicaule from a case of ringworm of three toe nails and tentatively accepted its pathogenicity Also Milian and Papadopoulos (16) Sartory Hufschmitt and Meyer (17) and others have reported cases of nail infections due to Penicillium brevicaule and Scopulariopsis minimus

Scott (371) reports what he claims to be the first case in the British literature of onychomycosis due to Scopulariopsis brevicaule Alkiewicz (372) presents his own clinical observations of infections of the nails caused by Scopulariopsis brevicaule The symptoms are yellowish white undernail stripes advancing towards the root of the nail Only toe nails and specially the nails of the big toe are infected The infection is always of long standing The plate of the nail is unchanged the yellow color shining through comes from horny masses on which the fungus grows The author proposed the term Acaulosis unguis as a definition of the clinical picture of onychomycosis due to Scopulariopsis brevicaulis

Negroni (251) believes that many onychomycoses are the result of infection with such fungi as aspergilli and penicillia He states that when a fungus is recovered in pure culture from a diseased nail when repeated cultures show the same fungus the causative relation is certain In thirty cases studied by Negroni Trychophyton rubrum was isolated three times T interdigitale five times Aspergillus sydowi three times Scopulariopsis brevicaulis three times and several others once

Kittredge (18) has reported a case of extensive dermatitis resembling tinea imbricata in which there was onychomycosis of all fingers and toes produced by a fungus similar to Trichophyton purpureum This case is very interesting for in the tropics these extensive eczematoid lesions of ringworm are very frequent and are often accompanied by nail lesions From such cases we have isolated cultures of Trichophyton rubrum

Kligman and Constant (373) report a family epidemic of tinea capitis and onychomycosis of the finger nails of many years duration in father mother and three children Trichophyton tonsurans (variety sulfureum) was cultivated in all cases

Onychomycosis due to Trichophyton purpureum has also been reported by Andrews (252)

Berston and Keil (253) have reported a case of onychomycosis due to Aspergillus flavus, probably the first report due to this fungus in the literature The symptoms consisted of greenish discoloration of the nail plate

An interesting report is that of Bereston and Waring (254) concerning a case of double infection by Trichophyton rubrum and Aspergillus nidulans on several fingers and toe nails

Moore (374) describes an infection of the nails in a fourteen year-old white girl in which three organisms belonging to three separate genera were isolated Two of the isolates were identified as Trichophyton rubrum and Candida parakrusei (C parasilopsis) The third fungus was studied in detail and showed some characteristics of Hyalopus (Cephalosporium) keratoplasticum morikawa, which appears to be closely related to, if not identical, with Hyalopus onychophilus (Veuillemin Aschieri)

Montgomery and Clasper (255) report 63 6 per cent of onychomycosis of the toes and 2 0 per cent of the fingers as caused by Trichophyton gypseum, while Trichophyton purpureum was responsible for 25 3 per cent of the toes and 8 1 per cent of the finger nail infections

A few cases were due to T niveum, T violaceum, M lanosum and Achorium schonleinii Monilia albicans caused 5 6 per cent of the toe infections of this type

Gomez (256) has reported lesions of the nails in cases of Tokelau or tinea imbricata observed in Guatemala in Central America These consisted of longitudinal grooves on thickened nails, ash gray in color, with raised borders

A case of onychomycosis probably due to a basidiomycete Schizophyllum commune has been reported by Kligman (349) The fungus grows as a saprophyte on dead wood plants

Among other rare onychomycoses, Sartory and Meyer (19) have reported a case due to Sporotrichum beurmanni, Heller (20) found Trichophyton faviforme in several members of the same family, Sartory, Hufschmitt and Meyer (21) have reported a case due to Eurotium diplocyste and another case (22), caused by Hemispora stellata, which is all the more interesting since superficial hemisporosis and particularly that of the nails is very rare



Fig 19 Onychomycosis of the finger nail and dermatophytosis of fingers Notice areas of desquamation in the skin Epidermophyton inguinale

Schnapka (375) reports a fifty six year old woman with nail changes of the index, middle, and ring fingers of the right hand and the left index finger, consisting of deep black discoloration of the lateral edges Scrapings from the nails and subungual hyperkeratosis revealed on culture Blastomyces dermatitides and an overgrowth ten days later of Alternaria tenuis This seems to indicate that Blastomyces is the pace maker for the weakly pathogenic black alternaria

Franks and others (376) report a remarkable case from a biologic rather than from a clinical point of view, inasmuch as it combines a rare form of onychomycosis and infestation

of the same nail with a mite The nails of the left big and second toes were found to be infected with Scopulariopsis brevicaulis and examination of the subungual debris from the big toe showed great number of ova, larvae and adult mites belonging to the family of Tyroglyphidae According to Reiss and Caroline (377) (quoted by Franks) in this case the mite belonging to the genus Dermatophagoides most probably subsisted in the debris resulting from the fungus infection and was not a fungus eater as happens with others, such as Tarsonemus confusus, Ewing which are notorious destroyers of fungus cultures

Brasciani (174) has reported a case of ringworm of all nails of both hands due to Microsporum audouini

Bleil (378) also reports Microsporum audouini as re sponsible for onychomycosis of the toe nails in a twenty two year old white male

Fox (379) considers Trichophytons gypseum and pur pureum the most frequent invaders of the nails in onycho mycosis

Lyons (380) reports onychomycosis of the index fingers of both hands caused by Microsporum lanosum

Franks and Frank (381) report extensive verrucous derma titis of the feet associated with dermatophytosis and onycho mycosis with marked dystrophic toe nail changes due to Trichophyton gypseum in a 14 year old child

Ringworm of the nails is more common in adults than in children and more frequent in the toes than in the fingers We have seen cases of onychomycosis in children 8 and 10 years old and Truffi (23) has reported a case in a child 18 months old The affected nails are usually a few, but MacKee (24), Phillips (25), Wise and MacKee (26), Wise (27), Kitt redge (185) and others have reported cases in which all the finger and toe nails were affected These cases are very rare and it is possible as suggested by Levin (28) that some

of these cases are in reality dystrophies of the nails with secondary parasitic infection

The frequency of ringworm of the nails seems to be greater in some localities than in others According to Hodges (29) in the Southern States the rate is that of one to 500 inhabitants or ten times greater than that found among immigrants at Ellis Island Sabouraud states (189) that onychomycosis is rare in Paris, no case having been found in 500 patients with dermatomycoses On the contrary, in Bordeaux, infection of the nails with fungi seems more common In Italy, it is very frequent, according to Pellizzari,

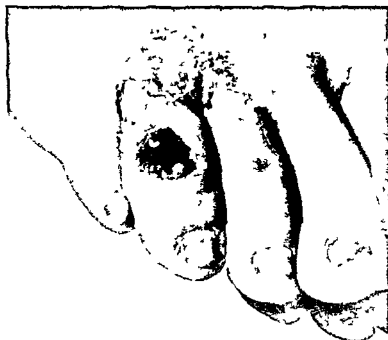


Fig 20 Dermatophytosis of the feet and onychomycosis (white culture trichophyton gypseum?)

who found twenty cases among 150 patients with dermatomycoses

Epstein (257) has reported onychomycosis as frequent in the Army of the United States an average of 4 6 per cent of the cases examined A report of a case with fifteen involved nails and another with twenty nails affected are included Trichophyton rubrum was a frequent offender in these cases Using the periodic acid Schiff stain Jillson and Piper (382) have found Trichophyton rubrum and Trichophyton mentagrophytes to have a peculiar predilection for the parasitized nail plates These hystopathologic studies were simplified by embedding the nail clippings in gelatin which permitted sectioning with the freezing microtoms without fixation T rubrum was chiefly confined to the thickened Schiff positive non glycogen ventral layer of the nail (Lewis (355) and did not invade the nail bed Occasionally the infection penetrated the Schiff positive transverse zone of the intermediate nail progressing all the way to the surface of the nail T mentogrophytes infection began and remained confined to the dorsal nail layer of the nail plate

Saprophytic fungi were found only in the dorsal nail and sometimes as far as the Schiff negative intermediate nail in cases which were also infected by either T rubrum or T mentagrophytes

Of 144 cases of onychomycoses the fungi cultured in Sabouraud s medium were Trichophyton rubrum 137 times and Candida albicans seven times These cultures were made at our service of the Calixto Garcia University Hospital in Havana Cuba There were ninety nine city residents and forty five from rural areas sixty seven were male and seventy seven female The finger nails alone were affected in eighty three cases and the toe nails alone were affected in thirty five cases both finger and toe nails were affected in twenty six

cases, 113 patients were white and thirty one were colored The percentage of onychomycosis in relation to all dermatophytoses seen at the same dermatological service was 12 27 per cent (462)

Favus of the Nails Favus is a rare condition in America, in France and in England It is more frequent in Italy, Spain and Central Europe The nails are occasionally affected and then the diagnosis is easy because there are always typical skin or scalp lesions According to Sabouraud (30) favus of the nails is extremely chronic and defies all forms of treatment Horand of Lyon (189) found five cases of favus of the nails among 472 cases of favus of the scalp and of the skin Wise (236) has reported a case of favus of the scalp and nails acquired in the United States The fifth finger

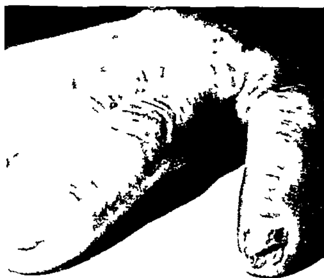


Fig 21 Onychomycosis Trichophyton interdigitale

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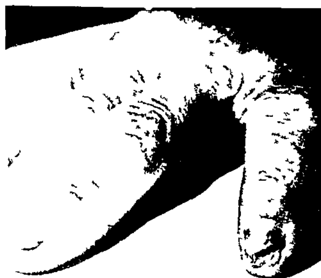


Fig 21 Onychomycosis. Trichophyton interdigitale

of the right hand and the third finger of the left hand were affected there was grayish yellow discoloration and sub ungueal hyperkeratosis American cases of favus have also been reported by Montgomery, Hopper and Lewis (210) by Robinson (211) and by Lewis (212)



Fig 22 Onychomycosis Trichophyton interdigitale

Cañizares (258) has reported a case of favus of all toe nails in a soldier who apparently acquired the condition in North Africa All the toe nails were hyperkeratotic, soft, translucent and yellow There was no favus of the skin or of the scalp The importance of this case as a reservoir of this stubborn mycotic infection is stressed as well as the danger to the community if such nail condition is ignored

Swartz and Rockwood (259) have reported favus in four generations In one of the patients the nails of the fingers were affected while in the other members of the family only the scalp and skin were infected The finger nails were deformed and showed yellow discoloration

The affected nails show a peculiar yellowish tint the nail plates become thickened scaly and powdery and a great amount of corneous material accumulates underneath The nails may be entirely destroyed after a time, presenting a honeycombed appearance and gradually disintegrating

Achorion schonleinii and Achorion gallinae are the fungi found

Onychia and Paronychia due to Monilia and Yeasts Parasitic onychia produced by monilia or yeasts is usually accompanied by paronychia and in these cases there is more or less abundant exudation Often the primary lesion is a paronychia which is followed by infection of the nail plate

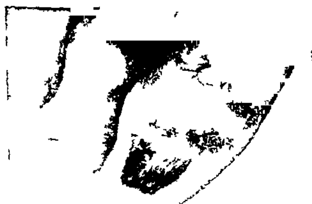


Fig 23 Onychia traumatica of many years duration, secondary infection with epidermophyton inguinale.

though the ungual lesion may be primary without any trace of paronychia Swartz (31) in reporting 12 cases of paronychia due to monilia in house wives, domestic workers and dishwashers, states that the nail is primarily involved, paronychia being a secondary reaction

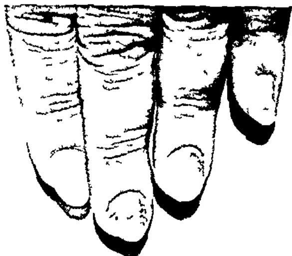


Fig 24 Monilia infection of the nails Beginning lesion producing superficial desquamation and slight paronychia

Paronychia in these cases is of the chronic type, affecting one or more finger nails, rarely the toe nails and very rarely all nails The predominating changes are slight swelling and redness of the peri ungual tissues with retraction of the nail wall and moderate exudation of serum or pus from the nail grooves This exudation contains the parasite in almost pure culture although staphylococcus albus is a common contaminator

Lesions of the nail plate are typical The plate presents one or more round or oval, cloudy white or creamy patches which invade the substance of the nail by peripheral extension These patches appear more often in the under surface

of the nail, separating it from its bed in a gradual manner, and show by transparency on the outer surface, but the lesions never destroy the nails in the manner of the ringworm lesions Sometimes a slight accumulation of corneous material may be observed under the nail plate, usually adherent to the nail itself and not to the bed



Fig 25 Monilia infection of the outer surface of the nail slight paronychia The nail plate was colored brown and green

Another type of moniliasis of the nail is that in which the affection is on its outer surface, showing desquamation, discoloration and cloudiness In these cases the color of the nail may be yellow, mahogany white or green In cases of long standing the nail may be dissociated and atrophic, and the clinical differentiation from onychia produced by derma tophytes becomes impossible In all these cases the lesions are dry and there is no paronychia

In some cases of paronychia with extreme maceration, the peri ungual tissues are white, retracted and cracked and the nail may be rather distorted and discolored

Kingery and Thiennes (32) have reported an epidemic of paronychia accompanied by dermatitis of the hands in the workers of a canning factory and proved that the infection



Fig 26 Monilia infection in a more advanced stage with destruction of the nail plates and chronic paronychia

was due to contamination of the fresh fruit which they handled Sutherland Campbell (33) has also reported an epidemic in workers who handled oranges, apparently produced by a yeast, which he believes to be the spore form, "gonidia of a fungus of the family 'mucoracea" The parasite was isolated from the nails and peri ungual tissues and from the pulp of the oranges but it was not found in the skin of the fruit This fungus was finally classified by Campbell and Plunkett (157) as a new species of mucor which they have named "Mucor paronychius" The lesions were sub-ungual with pus formation and clouding of the nail plate All peri ungual tissues were inflammed and droplets of pus could be expressed from them

Onychomycosis produced by monilia and oidium have also been reported by Guggenheim (34), Scott (35), MacCormack (36), Gray (37), Swartz (38), and many others Ciarrocchi (39) has reported a case of paronychia and onychia due to a fungus classified as mycetorula, a species considered

to be non pathogenic This was named Mycetorula onycho phila by the author and was pathogenic for laboratory animals

Balina Negroni and Basombrio (260) have reported two cases of paronychia maceration of the interdigital webs and hyperkeratosis of both feet and hands, due to Candida albicans



Fig 27 Monilia infection of the lower surface of the nail plate The lesions showed through the nail as a yellowish creamy patch

Pierini and Herrera (261) have reported lesions of the nails and nail bed due to monilia, with loosening of the nail plates and onychomadesis

In all these cases the parasite may be seen as round bodies of double contour varying in size from 2 to 12 microns in diameter according to the species Some of these bodies may be seen in the stage of division presenting the form of an hourglass or budding At times the presence of fat droplets or of degenerated corneous cells may be confusing Cultures are usually contaminated with pyogenic bacteria always present in the nails, but the parasitic growth can usually be isolated The cultures begin to grow at the end of twenty four to forty eight hours at room temperature They are smooth, shiny, compact, white or creamy and grow by peri pheral extension but the growth is rather slow When older

the colonies may show some central wrinkling or a central depression or crater In two cases we have found an orange colored monilia which became powdery when old In all other cases cultures have been white



Fig 28 Monilia infection of the lower surface of the nail plate with separation of the plate from the nail bed The color in this case was light gray



Fig 29 Monilia infection Onycholysis and corneous accumulation under the nail plate due to infection of the nail bed From this case an orange colored culture of monilia was recovered

Ivan Connor (156) isolated monilia albicans from thirteen cases of chronic paronychia The infection causes pad or bolster like swelling of the nail wall Isolation in pure

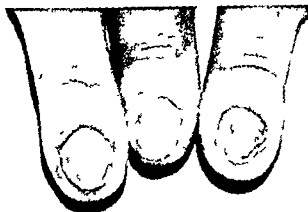


Fig 30 Paronychia and onychia due to yeasts The differential diagnosis with staphylococcic onychia is impossible unless microscopic and cultural proofs are obtained.

culture was difficult Connor advises soaking the mixed growth in five per cent sulphuric acid solution for twenty minutes and inoculating glucose agar slopes with the sediment Pure cultures may be thus obtained

Diagnosis of Onychomycosis Eczema psoriasis and onychia and paronychia due to bacteria should be excluded but the diagnosis rests on the presence of fungi in the nail tissue or in the pus

Onychomycosis coexists with dermatophytosis of the feet in about 30 per cent of the cases and in some instances erosio interdigitalis blastomycetica has been observed in cases of paronychia due to yeasts



Fig 31 Paronychia and onychia due to yeasts in a washer woman Notice the sodden appearance of the peri ungual tissues This patient s work consisted in starching white linen

Dermatophytids of the fingers may be the cause of a chronic onychia with secondary staphylococcic paronychia These cases are the result of nutritional disturbances produced in the nail matrix by the neighboring inflammation No fungi are found in them

Treatment of Onychomycosis. Treatment of onychomycosis is disappointing in many cases The first step should be trimming and filing the nail as much as possible without drawing blood, thus mechanically eliminating all infected tissue This procedure is simplified by the use of a mechanical drill devised by Kile and Welsh (248)

Radiotherapy in sub intensive doses is of great value, probably by determining certain changes in the tissues which prevent parasitic growth, since the roentgen rays have no parasitic properties, MacKee and Fox (40) Roentgen rays alone are seldom sufficient to cure the majority of cases of onychomycosis

Onychomycosis may be more or less difficult to treat according to personal conditions and also to the causative organism Trichophyton purpureum infections are notoriously resistant to treatment and at times are apparently incurable Old infected nails complicated with onychogryphosis may be entirely incurable, unless by surgical removal with destruction of the matrix

Rothman (384) after finding an increased glucose tolerance in oral testing in thirteen out of twenty cases with skin and nail infections due to Trichophyton rubrum, (purpureum) describes a new therapeutic approach for the treatment of this type of onychomycosis in the form of cotton pads soaked with a 75 0 per cent lithium bromide solution for one half to one hour every night, followed by spraying the affected nails with a solution containing 13 0 per cent glucose and 4 0 per cent Asterol dihydrochloride When dry, the nails were painted with a nail lacquer containing about 10 0 per

cent lithium bromide and 6 0 per cent Asterol tincture After twenty four hours the nail lacquer was removed with acetone and the procedure repeated

Nine patients were treated by Rothman by this method Three were cured after several months, and six started to grow healthy nail plates, but were still mycologically positive

Kesten and Benham (385) report thirty two cases of Tricho phyton rubrum onychomycosis treated by the Rothman method The results according to the authors were promising with two complete cures and nineteen considerable im provements

Nail infections with penicillia are just as stubborn as infection with Trichophyton rubrum, the nails becoming brittle, crumbling away in spite of all treatments However, Weidman and Glass (262) believe that lesions caused by T rubrum are not particularly distinctive and no more resistant to treatment than lesions caused by other fungi

Sabouraud (41) advises the use of wet dressings of iodine solution but this has failed repeatedly in our hands and even the application of pure tincture of iodine does not give the desired results

Stuart Way recommends a one per cent solution of iodine crystals in xylene, for the treatment of infections of the nails It seems to be more penetrating than the alcoholic solution

Elliot (42) advises the use of dry heat at a temperature of 300 to 400 degrees Fahrenheit Craik (43) has reported two cases treated with success by means of daily applications of a solution of 4 grams of salicylic acid in 45 cc of methylated spirit after thoroughly scraping the nail Wile (44) has reported good results with the method proposed by Foerster consisting of bathing the affected nails with a 12 per cent solution of sodium hyposulphite and immediately after with another solution of 2 per cent acetic acid twice a day

According to MacEwen (45) the acetic acid solution should be at least 6 per cent strong in order to get the best results. This treatment is supposed to act through nascent sulphur which develops in the chemical reaction between the two solutions Knowles (46) has reported good results from Labarraque's solution. The case of Sartory, Hufschmitt and Meyer (47) of ringworm of the nails produced by Scopulariopsis minimus was cured according to the authors by the internal administration of 0 05 grams of treparsol daily for several months.

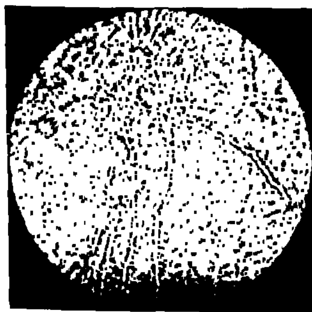


Fig 32 Photomicrograph of mycelium as seen in nail scrapings treated with 40 per cent potassium hydroxide

Iontophoresis with copper sulphate, that merited support as a method of treatment for dermatomycosis by some dermatologists, has been worthless in the therapy of onychomycosis

Nickerson and White (336) have reported good results in onychomycosis with the use of ammoniacal silver nitrate on the assumption that this chemical penetrates keratin and at the same time acts as a good fungicide Applications were made once a week, the nails turning a deep black Numbers of applications varied from one to ten in the sixteen cases treated, of which nine cases were reported as cured

Failure of this procedure in eighteen cases due to Tricho phyton rubrum was reported by Frank and Sternberg (343) and by Nathan (346) but they were successful with ammon iacal silver nitrate in cases of monilial paronychia

Filing off the diseased nails helps materially to shorten the course of the disease by removing mechanically a great *deal of the infected nail In any case the treatment must* be continued for several months or a year to obtain permanent results

White (386) disapproves of surgical avulsion of the nail plate in any case of onychomycosis, and also finds Whitfield's double strength ointment the most valuable preparation in the treatment of onychomycosis The addition of a 10 per cent precipitated sulfur to the Whitfield formula is helpful especially in T rubrum infections

Undecylenic and propionic acids and their salts and certain antibiotics used in the treatment of fungus infection, have failed to give favorable results in our cases of onychomycosis Such is also the experience of Shapiro and Rothman (263) and Franks and Taschdjian (387)

Ravits (388) based on the antifungal activities of the benzothiazoles in vitro, has treated three cases of onycho mycosis with the application of Asterol dihydrochloride tinc ture in a 5 per cent dilution in 70 per cent alcohol once daily followed by the application of a 5 per cent carbowax *ointment After four months treatment combined* with daily filing of the affected nails considerable improvement was

obtained in two cases Four cases of Candida albicans parony chia were also treated and cured in 4 10 weeks time

In monilia infections the treatment must also be contin ued until the diseased nails have been entirely replaced The nails should be thoroughly trimmed, the peri ungual grooves well disinfected with tincture of iodine and the source of contamination eliminated Howard Fox (48) has reported a case of onychomycosis due to monilia successfully treated with roentgen rays alone

Rockwood (155) advises the use of sodium perborate in the treatment of paronychia due to yeast infection The method of treatment is as follows The patient makes a thick paste of the sodium perborate with a few drops of water This is worked under the nail fold very gently with a small cotton tipped tooth pick, and then packed around at the sides and under the nail Without other dressing a rubber finger cot is drawn on and allowed to remain over night The purpose of the latter is to maintain and increase the moisture present The patient is then instructed to soak the affected fingers three times a day in a warm solution of sodium perborate made by adding two teaspoonfuls to half a glass of water, and to continue the soaking as long as effer vescence takes place This may be from one to three quarters of an hour According to Rockwood, cases of from three months' to five years standing have been entirely cured in from three to eight weeks

Barlow and Chattaway (389) consider of the utmost im portance to bring the fungistatic or fungicide agent to the site where the fungus is growing Urea facilitates keratin penetration by breaking the hydrogen links Under this assumption a solution containing 5 per cent metabisulfite of sodium, 0 13 per cent of phenyl mercuric nitrate, 50 per cent urea with the addition of 0 1 per cent calsolene oil was made, the patients were instructed to soak the affected feet

in this solution followed by the use of a spray made with a 2 per cent solution of ninhydrin and 0 13 per cent of phenyl mercuric nitrate in 50 per cent ethanol Treatment was repeated every two days In six weeks there was a marked improvement of the affected nails in the five patients treated

The simplest and perhaps the most efficient application in monilia infections is a 5 per cent solution of gentian violet in 70 per cent alcohol Nystatin which has proved very useful in vitro and in vivo in monilial infections of the skin may prove also to be a good choice in the treatment of monilial paronychia

Reiter (390) uses a silicone protective cream each morning in cases of monilial paronychia to avoid penetration of water, soap and other debris in the posterior nail folds, followed at night by the application of any standard fungicide preparation

It must be remembered that ringworm of the nails may be the source of repeated fungous infections of the feet as shown by Williams (49) and that in their beginning these lesions may be very slight and remain unrecognized

Infected shoes and stockings should be discarded or dis infected by means of formaldehyde in a closed receptacle

The most radical procedure employed in the treatment of tinea of the nails is surgical removal under general or local anesthesia and this has been used at times in immigrants who wish to enter the United States In private practice very few patients would undergo such treatment The healing and regrowth of the new nails take as long as six months *(at least four months) and when several nails are affected* the patient may be entirely incapacitated On the other hand the new nail may also be infected To prevent this some surgeons destroy the matrix with the actual cautery resulting *in painful and sluggish ulcers and the eventual* formation of distorted scar tissue Taylor however has been successful with this method of treatment (177)

In our hands the use of a 40 per cent commercial preparation of salicylic acid plaster has proved very useful for softening the diseased nail plates in cases of onychomycosis The salicylic acid plaster is maintained over the affected nail during four to six days then the nail is easily removed with nail clippers In most of our patients from two to four successive applications have permitted the clipping of the nail plate to the limit of the posterior nail fold exposing the nail bed to the action of antifungal locally applied medication This procedure allows the painless elimination of the nail plate and permits the patient to maintain his usual activities

Vilanova and others (391) claim the lunula to be the most susceptible part of the nail bed in experimental inoculations with fungus material In these experimentally inoculated cases the disease never persisted beyond 180 days due probably to the allergic immunologic reaction produced by the massive character of the experimental induced fungus infection According to these reports the authors best choice to obtain a permanent cure in onychomycosis is by surgical avulsion of the diseased nails

Kurtin (392) introduces with a 25 gauge needle hyaluronidase (100 turbidity units per cubic centimeter of distilled water) under the distal end of the nail for surgical removal of the nail plate after blocking the digital nerves in the usual fashion with a 2 0 per cent procaine solution After a few minutes the nail can be cleanly removed by gentle traction

Treatment by avulsion of the nail plate has been opposed by many experienced dermatologists

Trichophytin which is sometimes very useful in dermatophytosis has been disappointing in ringworm of the nails

Griseofulvin The treatment of onychomycoses caused by the filamentous fungi has been radically changed in the

last year, 1959 The internal use of Griseofulvin, an antibiotic obtained from Streptomyces griseofulvum and developed at the Glaxo Laboratories of London, England by Oxford, Raistrick and Simonar in 1939 (457) Later Brian, Curtiss and Hemming (458) isolated the same antibiotic from Penicillium jankzeewskii This antibiotic has revolutionized the therapy of superficial mycoses Local treatment is hardly necessary except for the prevention of reinfection from shoes, stockings and other wearing apparel and also to prevent relapses in cases in which the patients stop the treatment by Griseofulvin too soon Griseofulvin is not a fungicide, but a fungistatic and therefore, treatment must be continued until all infected tissue is eliminated It is to J C Gentles (459) that we owe the first experiences on dermatological use of Griseofulvin in animals

Griseofulvin is administered in the form of 250 mmg tablets of pure white color, at the average dose of 1 gm daily in four individual doses, one every 6 hours taken with a glass of water In the treatment of nail phytoses this dose must be continued for about four weeks, followed by a reduced dose of 500 to 750 mmg daily for a total of 3 to 4 months which is the average time necessary for the complete replacement of the affected nail In cases in which only parts of the nails are affected, the length of treatment is in proportion to the size of the affected portions In large hypertrophic toe nails the treatment must be maintained until the whole nail is replaced, in some cases as much as 5 months Recovery may be hastened by clipping the infected part with nail clippers

Griseofulvin is well tolerated Allergic or toxic reactions are extremely rare and in any case mild and transient In the rare cases in which Griseofulvin is ill tolerated or causes allergic or toxic reactions, local treatment as outlined previously, must be used In our experience such cases are

exceptional about 4 per cent of all cases treated Headaches abdominal distress diarrhea and in one case a morbilliform rash of short duration were apparently symptoms of intolerance to Griseofulvin In most cases treatment was resumed without further reactions or inconveniences It is wise to avoid alcoholic drinks and highly spiced foods during treatment with this antibiotic

It is important to remember that Griseofulvin is ineffective in cases of moniliasis and of deep mycoses

Griseofulvin used locally in ointments creams suspensions solutions or in powder form is not effective Its fungistatic action is due to its chemical combination with keratin and therefore its use as a local preparation is not recommended Local adjuvant treatment of onychomycoses with chemical fungicides is not necessary in the majority of cases but reinfections may occur from shoes and stockings or other sources of contamination Some cases however seem to improve faster if a local fungicide is rubbed daily on the affected parts

The literature on Griseofulvin has grown tremendously in the last few months at this writing In America the first report was that of Harvey Blank (460) and later the writers of this book followed in March 1959 (461)

UNGUIS INCARNATUS
(Ingrowing Toe Nail)

This condition is due to the penetration of the lateral edges of the nail plate into the tissues of the nail grooves and as a consequence the establishment of a more or less acute inflammation with secondary pyogenic infection

Two etiologic factors enter into the production of ingrowing toe nail first a special configuration of the nail which is often familial and second the use of tight ill

fitting shoes The nail in these cases is usually excessively curved laterally and the skin outside of the nail grooves forms a sort of fold which overlaps the nail plate, facilitating the ingrowing by the pressure exerted downwards on walking Naturally short nails also favor the development of this condition Obesity and flat foot are contributing factors Excessive use of hot water and hyperhidrosis of the feet also favor the formation of ingrowing toe nail Sometimes the exciting cause is injudicious cutting of the nails The patient experiences a little pain on the side of the nail and in an endeavor to overcome it, cuts the nail down the side, leaving a small splinter attached to the nail plate, which, in time, growing forward and piercing the sulcus causes ulcer



Fig 33 Unguis incarnatus (ingrown toe nails)

ation, inflammation and overgrowth of connective tissue (granuloma pyogenicum) (194)

One or both of the lateral edges of the nail in one or both feet, sink deeply into the groove producing slight pain on walking until finally the corium is torn and slight secretion results which in time becomes infected with the production of pus The parts then appear red and swollen and occasionally a small button of proud flesh which bleeds freely may appear between the nail plate and the groove This lesion is extremely painful It is more frequently seen in persons between fifteen and thirty years of age

Fox (264) has reported ingrown toe nails with granuloma pyogenicum in brother and sister, due to exaggerated convexity of the nails, a familial feature The treatment in cases of that type consists in the permanent removal of the nails with destruction of the matrix to prevent regrowth

Lymphangitis and panaritium may be observed as complications In chronic cases with little inflammation the nail plate becomes distorted, discolored and hypertrophic True onychogryphosis may result in neglected cases

Ingrowing toe nail requires surgical removal of the nail plate or at least of the half corresponding to the affected side Some surgeons advise the excision of the lateral groove and of the skin of the side of the toe while others content themselves with removing the nail and packing the resulting gap with gauze Destruction of the proliferating connective tissue, which appears as a red fleshy papule or granuloma pyogenicum is necessary together with local antiseptic measures to check infection In the acute stage, wet dressings of potassium permanganate solution (1 to 3,000) are effective

Local application of sulfathiazol powder, antibiotic ointments or antibiotic powders are very effective against pyogenic infection

Relapses after surgical treatment are not uncommon Keyes (158) reports 13 6 per cent of relapses in 110 operations Removal of the matrix is essential to permanent success The Winograd operation (159) seems to be the best procedure according to Keyes Primary union should be attempted when possible Complications are cellulitis arthritis and osteomyelitis Surgical treatment should be performed only when palliative measures applied for a week or two have failed An original operative procedure is practiced by Barttlet (213) The basic principle of this procedure differs from others in that a wedge of soft tissue is removed from the side of the toe through a noninfected field with the result that when the skin edges are brought together the nail wall is pulled away from the edge of the nail plate and held away permanently by the subsequent scar tissue formed Barttlet claims that healing is invariably by first intention

In early cases it is possible to arrest the progress of the condition by raising the toe nail from its bed by means of a small pledget of cotton stuffed under the free edge of the nail thus relieving pressure on the lateral grooves The nail should be trimmed allowing the lateral part to grow forward Correction of flat foot when present and wearing properly fitting shoes are instrumental in preventing relapses

PTERYGIUM

Pterygium is an exaggerated growth over the nail plate of the remains of the eponychium In the fetus the nail is encased in a sac of corneous cells which represents the eponychium of lower animals This epidermal layer disappears before birth and is only represented by the thin crescent shaped film which limits the nail wall at the proximal end of the nail and which advances in normal fingers

and toes only a fraction of a millimeter over the plate This is commonly known as the nail cuticle

This epidermal membrane may in some pathologic conditions advance two to three or more millimeters over the nail plate and become adherent to its outer surface This is seen accompanying such conditions as peripheral neuritis leprosy sclerodactylia and atrophy of the nails of different nature It is a common condition in the last two toe nails in apparently normal persons In the finger nails it is also seen in cases of onychophagia According to Ormsby (50) and others roentgen rays used therapeutically in repeated doses may cause pterygium of the nails The same condition has been observed in radiologists

Cases have been reported in which pterygium covered the entire nail plate but these were in the new born and represented the persistence of the eponychium covering the extremities of the fingers and toes during intrauterine life

Treatment of pterygium consists in cutting the excessive growth with fine pointed scissors The use of weak alkaline solutions in manicuring is as a rule harmless

HANGNAILS

(Agnails Envies Niednagel)

This condition is very common in persons who handle irritating substances such as acids cement lime and other chemicals and also in onychophagia It consists of one or more raised filaments of corneous epidermis in the lateral skin or in the nail wall affecting one or more fingers These corneous filaments are usually triangular in shape with a pointed distal end and a proximal adherent base The base is often excoriated and slightly inflamed causing at times intense pain This may be the point of entrance of infection resulting in panaritium In physicians dentists nurses and midwives it may be the site of implantation of spirochaeta

pallida with the development of a syphilitic chancre This is at present a very rare occurrence

Treatment consists of flattening the filament and securing it with flexible collodion Adhesive plaster which is often used by patients has the disadvantage of soiling easily and on removal it pulls the epidermis and traumatizes the excoriated base, causing pain When infection has set in the best procedure is to cut off the piece of loose epidermis and touch the base with an antiseptic tincture or an antibiotic ointment In greatly inflamed cases a wet dressing of boric acid solution or of potassium permanganate (1 to 3,000), followed by the local application of a mixture of antibiotic and corticoesteroid ointment, are effective to reduce inflammation

HEMORRHAGE

Sub ungual hematoma is usually the result of trauma The nail appears stained red by the suffused blood, but the color turns to coal black after coagulation Hematoma may be complicated with inflammation and intense pain for a few hours after the traumatism As a rule the nail becomes loose and falls off after a few weeks and is replaced by a normal nail When the coagulum becomes infected a cellulitis may develop or an abscess may form under the nail

Siler (265) reports among the injuries of the upper extremities 4 3 per cent of ungual hematoma

According to Heller the ungual plate may suffer a fracture and a coagulum is then formed inside of the nail substance When the nail remains the black spot of coagulated blood grows with the nail until it is finally eliminated at the free edge

In scurvy, hemophilia and purpura, hemorrhage may occur in a diffuse form or in small petechiae in one or more nails In these cases hemorrhage is due to the spontaneous

rupture of the capillaries of the sub ungual corium or to the increased permeability of the vessel walls or to blood dyscrasia

Vicarious hemorrhages of the nails have been reported but according to Heller are very rare The cases reported have been in hysterical women or in cases of dysmenorrhea

Vibices in the form of transverse lineal hemorrhages are one of the constant phenomena in endocarditis lenta

Fisher (394) described sub ungual splinter hemorrhages with very painful finger tips in a forty five year old woman with proved trichinosis infestation McNaught (395) has found that these unique sub ungual hemorrhages have been reported, as occurring in from 10 to 30 per cent of the cases of trichinosis in severe infestations in the early invasive stage The hemorrhages are due to mechanical bursting of the larvae throughout the capillaries These splinter hemorrhages differ from those that occur in endocarditis in that in trichinosis the hemorrhages occur all at one time and are all in one stage of development These hemorrhages can also occur in the toes

Berardo and Lumiere, quoted by Heller have reported cases of hematoma and sub ungual hemorrhages in five out of seven cases of tetany

Fordyce and Heller have reported cases of hematoma of the nails of idiopathic nature in apparently healthy persons In the case reported by Fordyce the condition had recurred for more than thirty years

Póor (51) has reported a case of multiple sub-ungual hematoma in a patient with post encephalitic Parkinson's syndrome

Oliver and Zakon (266) have reported a case of purpura of the finger tips and nails with numbness and blue and purple discoloration, due to the repeated use of Neo-synephrine nose drops The condition subsided slowly on

discontinuation of the drug Ebert, in the discussion of this case reported purpura of the nails due to acetylsalicylic acid in quantities of 4 to 5 grams a day, for tabetic pains

Sullivan (396) *reports sub ungual allergic purple brown* discoloration with painful finger tips in a forty two year old woman after using a base coat under the nail polish for two consecutive weeks Patch test was strongly positive to the suspected nail base coat as well as to other three brands of nail base coats and to a rubber solution which is one of the main ingredients of the base coat

Long, Jr (455) has reported three cases of sub ungual haemorrhages in pan washers using detergents and rubber gloves in the washing process The sub ungual haemorrhages *subsided and finally disappeared when the patients changed* their occupation A change in the pH of the detergent solution found inside the gloves and the trauma associated with scrubbing apparently were the primary etiologic factors

Sub ungual hematoma is often seen in old age in cases with atrophic skin and nails

In cases of profuse hemorrhage of the nail bed, the pain may be excruciating These cases are the result of injuries with hammers or similar tools and are common in industrial surgery *These patients may be relieved almost at once* by drilling one or several openings in the nail plate, through which the blood or blood serum may ooze out Industrial surgeons use for this purpose, a small drill which may be held against the nail without much pressure The instrument about the size and shape of a mechanical pencil, has a round blunt top, and a small pointed drill at the other end The instrument is held vertically on the nail, with the thumb of the left hand and the shaft worked around with the fingers of the right hand, until the nail is pierced This procedure *may be repeated a number of times until* all the blood is evacuated from under the nail plate

NEW GROWTHS

Chondroma and Exostoses Chondroma is one of the rare sub ungual tumors It develops at the expense of the bone of the last phalanx and raises and displaces the nail with resulting deformities

More common are the bony excrescences known as exostoses These are not true tumors but outgrowths of normal bone tissues or calcified cartilaginous remains They are round or oval elevations deeply situated, sessile or pedunculated varying in size from a few millimeters to two or more centimeters As a rule one growth is observed but occasionally many more are seen in one or several fingers or toes The color is that of normal skin or slightly reddish the consistency is very hard and the lesions are usually painless unless traumatized Roentgen ray examination is necessary to establish the differential diagnosis from fibroma and other tumors

Coming from the subjacent bone these growths raise the nail in toto break through one of the sides or even through the plate itself and the nail becomes distorted or is shed

L W Shaffer (52) has reported a case of exostosis in a girl aged twelve who presented a pedunculated tumor projecting from the internal border and from underneath the nail of the left great toe The size was approximately that of a hazel nut and it had a very dense laminated cortex It was slightly movable and painless The macroscopical appearance was that of a dense fibroma but roentgen ray examination showed the presence of bone In this case the lesion had existed for about a year and there was a vague history of trauma

Shaffer in another article (53) reports four additional cases of sub ungual exostoses He describes these cases as *benign painful tumors* appearing as fibrous nodules the size

of a pea beneath the inner margin of the toe nails They arise from cartilaginous outgrowths of the last phalanx and later become ossified They are most frequent between the ages of twelve and thirty These growths may be confused with granuloma pyogenicum ingrowing toe nail fibroma and malignancy The exostosis is a firm nodule which in the early stages is pink and later becomes keratotic These growths probably represent a teratologic anomaly although trauma may be a causative factor

Stokes and E S Lain have reported similar cases According to Shaffer there are only about thirty five authentic reports in the literature

Heller refers to a classical case of Kast and Recklinghausen of multiple chondromas of the fingers and toes producing a colossal deformity

Griggs (54) has reported a case of sub ungual exostosis in which the tumor was ulcerated under the nail of the

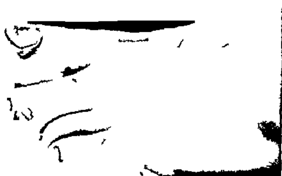


Fig 34 Exostosis of the great toe The growth has destroyed the nail plate the remains of which may be seen as a crescent shaped formation. (Courtesy of I Ferrer M D)

great toe. The condition had existed for two months. Diagnosis was made only after roentgen ray examination.

Treatment consists of complete surgical removal.

Epithelioma. Epithelioma is not very common in the nail bed or the nail matrix. When present it develops from the epithelium of the bed, the matrix or the nail grooves. Epithelioma of the finger may invade the nail tissues by peripheral extension. The tumor may be hypertrophic or ulcerated and is usually of the prickle-cell variety and rather malignant. The nail plate becomes loosened and falls off or becomes dystrophic with frequent secondary infection.

We have reported three cases of epithelioma invading the nail tissues. The first case was that of a white woman aged fifty who had been injured by a piece of wood four years before, some splinters entering between the plate and the bed of the thumb nail. Three years later the nail became pain-



Fig 35: Exostosis of the last phalanx of the great toe. (Courtesy of I. Ferrer, M.D)

ful bled easily below the free edge and soon was raised and partially separated by the growth Cutting off the anterior portion of the nail plate disclosed a small flat ulcerating and bleeding tumor in the center of the nail bed Histologic examination showed the structure of prickle cell epithelioma Radium treatment was apparently successful

The second case was that of a colored man aged forty five who gave a history of arsenic ingestion for many years and who had developed punctate keratoses of the palms and fingers One of these keratotic points adjacent to the nail of the right middle finger had been picked repeatedly until finally a small ulcer developed which failed to heal



Fig 36 Epithelioma of the nail bed

This spread about the nail uncovering the root and causing an irregular ulcer which histopathologically proved to be a prickle-cell epithelioma In this case radium treatment was also apparently successful

The third case was the most interesting of the three being one of Bowen s disease with epitheliomatous degeneration of the prickle-cell type This occurred in a white woman aged seventy five who for three years had had what appeared to be an eczema of the last phalanx of the middle finger with loss of the nail and gradual extension of the lesion to the rest of the finger The condition consisted

of an erythematous surface covered with yellowish adherent crusts and keratotic edges which in the inner part of the finger became a fungating mass about one-third of an inch in diameter Histologic examination showed the typical structure of Bowen's disease in the erythemato keratotic parts and that of prickle-cell epithelioma in the hyper trophic mass The patient had two other patches of Bowen's disease on the left side of the neck The finger was amputated

Ingram (55) has reported a case of scirrhous carcinoma of the breast with metastases in the nail fold of one finger



Fig 37 Epithelioma of the peri ungual tissues The tumor was the result of degeneration of arsen cal keratoderma punctata Notice two small keratoses in the index finger

Carcinoma of the nail matrix of the big toe has been reported by Chagas (143).

Russell (397) reports primary carcinoma of the right index finger with considerable bone involvement of the terminal phalanx, following an injury with an air hammer; and Bayer (399) adds two more cases of primary carcinoma of the nail bed in apparently previous normal nails. These are the first reports of primary carcinoma of the finger nails since Levine and Lisa (398) reviewed the literature in 1939, in which only nineteen cases of primary carcinoma of the finger nail had been reported.



Fig 38: Bowen's disease of the nail bed and skin of the finger.

Melanoma. These tumors are often developed at the expense of melanotic cells in the matrix or in the periungual skin. Sometimes these cells are present from birth

in the form of pigmented nevi of the bed visible through the nail plate When situated in the matrix they cause pigmentation of the nail cells in the form of a band or stripe of chocolate or black blue hue When this nevus grows rapidly and shows a certain degree of apparent in flammation malignancy should be suspected The nail soon becomes raised from its bed and distorted These tumors are here as elsewhere of very malignant character

Noble and Ferrin (400) report a black band 3 mm in width and extending from the base to the free edge of the left fifth finger in a twenty four year old white dentist of four years duration Amputation was recommended of the last phalanx of the affected finger when the lesion began to increase in length and width Histopathologic diagnosis was junction nevus

Melanoma occur most often in the toes We have seen one case affecting the nail groove with invasion of the nail bed of the great toe in a seventy five year old white man It was a blackish tumor occupying the lateral external groove of the nail bed about the size of a hazel nut The black discoloration invaded the adjacent tissues and the nail plate itself Due to the poor condition of the patient a radical operation was rejected by the surgeon and only the toe was amputated The patient died sixteen months later with multiple metastases

The diagnosis was confirmed by histopathologic examin ation

Melanoma is rare in the finger nails According to Heller about twenty three cases have been reported of which twelve were in men and eleven in women

Non pigmented nevo-carcinoma has been reported as in the case of Ferrand and Doblevitch (56) in which the tumor resembled a granuloma pyogenicum of the nail groove

In our experience accurate histopathologic diagnosis is essential for the proper treatment of nail tumor Recently an elderly patient consulted with small lesion of the right thumb Biopsy was reported as epithelioma of 'small clear cells After x ray therapy the lesion appeared to heal only to reappear with rapid growth a few weeks later A new biopsy revealed malignant melanoma and the patient died with multiple metastases a few months after amputation of the diseased finger

Engman and Mook (57) have reported under the name of melanotic whitlow a case beginning as a longitudinal band of pigment along the nail plate After some time the nail became fissured and small tumors appeared at the base of the nail having the appearance of granulation tissue The condition affected the left great toe nail and finally became a fungating mass of slate blue color

Treatment consists in amputation Most surgeons advise against the removal of the tumor and favor early amputation with removal of the glandular mass of the Scarpa triangle

Two cases of sub ungual melanoma (melanotic whitlow of Hutchinson) were reported by Duperrat and Cintract of Paris (340) Vegetating tumors of the nail bed displacing the nail plate were the main features According to the authors this tumor is more frequent on the fingers than on the toes, in France Early amputation of the finger, they say may be life saving

Walker and Stewart (401) present a case of recurrent subungual melanoma (melanotic whitlow of Hutchinson) in a fifty two year old white man, a few weeks after the surgical removal of a brownish discoloration of the nail plate of the left thumb of two years duration

Sarcoma Sarcoma of the sub ungual tissues is developed *either from the subjacent bone or from the connective tissue of the corium It is a very rare tumor*

Heller (58) has found in the literature four cases of angiosarcoma, a case of colloid sarcoma and seven cases of round-celled and spindle celled sarcoma

These tumors usually raise the nail plate or grow between the plate and the bed toward the tip of the finger assuming the form of an irregular, reddish, gray or greenish mass which bleeds freely at the slightest trauma They grow steadily and rapidly and the prognosis is bad Metastases and generalized sarcomatosis end the life of the patient usually within the first year

Differential diagnosis must be made in some cases from granuloma pyogenicum, epithelioma and exostosis, the histopathologic examination being the only safe basis for this differentiation

Treatment should consist not merely in the removal of the tumor or of the toe or finger, but in amputation of the leg or arm followed by roentgen therapy of the groin or axillae

Granuloma Pyogenicum. This is usually a small, fleshy, red growth, pin head to pea sized, bleeding readily and situated in the lateral grooves of the nails or at the tip of the finger below the free border of the nail plate

Granuloma pyogenicum is a complication observed in cases of unguis incarnatus (ingrowing toe nail), paronychia staphylococcica and traumatic onychia and paronychia It is seen more frequently in the great toe and usually one lesion or at the most two are present

Granuloma pyogenicum follows infection or trauma, grows slowly and histopathologically is composed of granulation tissue These characters serve to differentiate it from sarcoma and exostosis

Treatment consists of destruction with the high frequency spark In cases of small growths cauterization with trichlor oacetic acid followed by the local application of sulfathiazol powder gives good results

Synovial Cysts. These lesions are seen on the dorsal aspect of the fingers in the vicinity of the joints They are composed of a superficial serous sac connected with the synovial mem brane of the joint by a narrow neck or duct, but eventually they become entirely detached Occasionally one of these pea sized new growths may appear at the root of the nail as in the case reported by Fordyce (59). In this case the cysts were on the terminal phalanx near the base of the nail. They were tense and whitish in color and on incision there exuded a substance like the white of egg Two of the lesions were cured by curetting while a third recurred In the discussion of this case Trimble suggested the diagnosis of synovial cysts

Longitudinal grooving of the nails caused by synovial cysts has been reported by Anderson (324) We have seen two

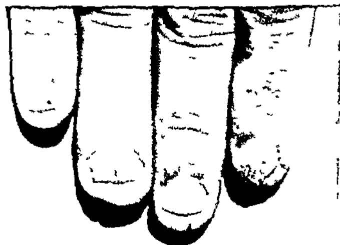


Fig 39 Verruca vulgaris of the nail bed and finger tip of the index Traumatic ridge of the ring finger Notice hangnails of the middle finger

such cases the groove is shallow and smooth and about 2 to 3 mm in width It slowly disappears after the removal of the cysts

Roentgen ray treatment in intense doses filtered by one millimeter of aluminum and the intrasynovial injection of hydrocortisone acetate 5 to 10 mg or hyaluronidase 150 turbidity reducing units is the best therapeutic precedure in these cases

Verruca Vulgaris Verruca vulgaris or common warts develop in the nail grooves the retro ungual fold and on the finger tip filling the sub ungual space They are common and as a rule affect several fingers at the same time They are less common on the toes



Fig 40 Verruca vulgaris of nail wall (Courtesy of Dr Howard Fox.)



Fig 41 Verruca plantaris A most extensive case Notice the pointed keratotic nail

Like verrucae in any other location, they are dry, yellowish keratotic, hypertrophic lesions which often present one or two capillary loops which bleed profusely if the verruca is cut When present in the posterior fold they may interfere with the proper function of the matrix and consequently the nail plate becomes deformed presenting longitudinal grooves or fissures In extreme cases large verrucous masses may raise the nail and loosen it from its bed



Fig 42 Peri ungual fibroma Beginning lesions

When the patient picks the lesions as often happens, the nails of the opposite hand become contaminated and new warts develop Warts are especially common in children and may affect all the fingers as the lesions are autoinoculable

Left alone verrucae continue to grow and invade the neighboring skin of the fingers They sometimes disappear spontaneously or under psychic influences though this phenomenon still lacks satisfactory explanation As a rule it is necessary to use some therapeutic measure and the best is

unfiltered roentgen rays in subintensive or intensive doses One or at the most two or three applications may be sufficient to make the verruca disappear without any trace Electrodesiccation has also been employed but is painful and may leave scars Intramuscular injections of bismuth salicylate have been recommended

The local application of salicylic acid plaster 40 per cent concentration for four to six days softens the verrucous tissue, which may then be eliminated with nail scissors The base is then cauterized with trichloroacetic acid crystals or nitric acid In many cases this therapeutic procedure has proved to be very successful

The most efficient treatment for verruca vulgaris is at present the application on the affected sites of a drop of the following mixture

Cantharidine	0 70	gm
Acetone		
Collodium āā q.s	100 00	cc.

The preparation dries up in a few seconds leaving a white film on the verruca The part is then covered with a piece of plastic adhesive for 4 to 5 days On removing this dressing the verruca appears macerated and often surrounded by a blister It is then easily removed with fine pointed scissors It is wise to touch the center of the softened verruca with concentrated trichloracetic acid to prevent a relapse An aseptic dressing with an antibiotic ointment is then applied for 3 to 4 days

This method of treatment has been very successful in the experience of the authors of this book It was reported for the first time by Epstein and Kligman (456) of the University of Pennsylvania in 1958 –

Fibroma Peri ungual fibroma is fairly common Fibroma in this location are small tumors made up of fibrous bundles with or without proliferation of the surface epithelium

When the epithelial layers become hypertrophied the tumors are lobulated and are sometimes called papilloma They usually develop along the nail grooves of the nail wall, deforming the nail by pressure or by action on the nail matrix



Fig 43 Photomicrograph of a section of case 42 showing proliferation of the conjunctive tissue and vascular lakes large granular layer and hyperkeratosis

One of the most typical cases observed by us was that of a thirty five year old woman who had multiple papillomatous fibromas affecting the finger and toe nails On the index finger of the right hand there were two elongated growths about five millimeters in length situated in the posterior fold of the nail and extending upon the ungual plate These lesions were pinkish in color and had cornified tips The ring finger of the same hand presented small irregular sessile tumors three to four millimeters in size with distinct lobulations In all the toes were hypertrophic lobulated masses occupying the lateral grooves and the posterior fold of the nails The consistency of the latter tumors was that of fibrous tissue and their color was yellowish pink like that of the normal skin of the toes Histopathologic examination showed a structure very much like that of angiokeratoma in the young lesions of the hands with great vascular lakes in the upper part of the corium and marked hyperkeratosis of the epidermis The older lesions presented the structure of fibroma the tumor being covered with acanthotic epidermis In this case the nail plates were deformed One of them presented a longitudinal canal or



Fig 44 Peri ungual fibromas Lesions of the toes Same case of Figures 42 and 43

groove about two millimeters in width and the other nails presented lesions of onychorrhexis, particularly marked in the toes These disturbances of the nail plate were clearly due to interference with the proper function of the matrix

Adenoma sebaceum of the face may be accompanied by warty and papillomatous lesions of the peri ungual regions and of the nail bed, sometimes associated with mental inferiority (165) This syndrome has been described in the European literature under the name of Morbus Pringle'

Butterworth Thomas and Wilson, Jr (267) *report ten* cases of this condition, five of which had changes of the nails such as white transverse bands, longitudinal striations and peri ungual fibromas

Treatment consists of electrodesiccation but care must be tak*en to destroy them deeply enough to prevent relapses,* without touching the nail matrix, in which case the result would be a permanent distortion of the nail plate

Angioma Angioma may develop under the nail in the form of a small tumor of bright red color, the latter disappearing under pressure This *differentiates angioma from* hemorrhage It may be larger and occupy the entire nail bed

Vascular nevi of the port wine variety occur occasionally on the hands and feet In two cases seen by us one affected the thumb nail and *the dorsum of the finger and of the* hand and the other affected the dorsum of the foot and the great toes nail In the first case the nail presented a violaceous color but it was normal in all other respects In the other *case the nevus* had ulcerated about the *nail*, the nail plate had fallen off and the resulting ulcer proved very rebellious to treatment

Radium, electrodesiccation and carbon dioxide snow have their indications here as in nevi elsewhere In using radium it must *not be forgotten* that the nail matrix is very radio

sensitive and that atrophy of the nail may be the consequence of doses which are apparently within normal limits

Port wine nevi should not be treated, but left alone, the results of any treatment being unsatisfactory



Fig 45 Port wine nevus and loss of the nail due to spontaneous ulceration of the nail wall

Clavus Clavus is exclusively found in the toes When affecting the toe nails it is usually situated on one of the grooves or under the free edge, between the nail and the bed, spreading to the skin of the tip of the toe In this location a corn is very painful and should be removed

Clavus in this location is due to short shoes pressing on the ends of the toes and a change in the style of footwear is required to prevent relapses Under the name of "heloma" chiropodists describe a sub ungual corn, very painful on pressure The corn has a putty like appearance beneath the transparent nail, but it may have dark red marks from extravasation of blood Treatment in these cases consists

of the removal of a V shaped section of the nail and extirpation of the corn with a scalpel (194)

A callus situated on the lateral nail groove is called "onycophosis" by chiropodists, seems to be more common in women than in men and may be painful and lead to infection

Glomus Tumoralis Sub ungualis Very rare, but one of the most interesting tumors of the nails is the glomus tumoralis, first described in detail by Barre and Masson (60) This is a minute, very painful tumor which develops in the corium of the nail bed, arising from the vasculo musculo-nervous compact (glomus) of the end of the finger These structures consist normally of arterio venous lakes surrounded by a smooth muscular coat and a plexus of non medullated nerve fibrils Trauma or other disturbance of the circulation of the end of the finger may cause this structure to proliferate, with the formation of angiomatous tissue This presses on the nervous plexus and causes exquisite pain which extends to the hand and arm and reaches up to the shoulder The tumor shows through the nail plate as a tiny bluish discoloration, but this is seldom noticed by the patient who merely complains of the excruciating pain, both spontaneously and on pressure In one case seen by us the diagnosis of chronic neuritis had been made

In one of the cases reported by Barre and Masson the nail was slightly raised by the growth and the lunula presented a diffuse appearance the white surface spreading forward in the nail plate

Facio (61) has reported another case which recovered after operation

In our case the patient was a forty five year old woman who eight months before had suffered a slight trauma of the middle finger of the left hand The nail was at first only slightly painful but gradually the discomfort became worse

and finally the pain was constant day and night The nail plate was normal but the tell tale blue spot could be seen through the nail tissue Removal of the nail and of the subjacent tissues under general anesthesia resulted in the immediate subsidence of all pain The sub ungual tissues should always be scraped down to the periostium of the phalanx (because the tumor is not encapsulated) and must be extirpated together with the sub ungual corium

In recent years three more cases of glomus sub ungualis have been seen by us All were cured by surgical removal of the tiny tumor situated in the nail bed

Chapter IV

ONYCHODYSTROPHIES

Dystrophies of the nails may affect the nail plate alone or all the ungual tissues Often their cause cannot be ascertained but at times they are clinical manifestations of different pathologic syndromes, either cutaneous or systemic Therefore onychodystrophies are only symptoms which may be due to the most diverse causes Nevertheless they must be considered as a group principally because of their complicated terminology and also because often the only possible diagnosis is that of the clinical manifestation In general dermatology we often have the same problem, as for all we know, lichen planus and psoriasis and eczema may be due to a score of different causes Such is the case indeed in dermatitis and erythema multiforme

In the chapter on the ungual manifestations of dermatoses and systemic diseases we shall have opportunity to refer to dystrophies again in connection with their causation

Hypertrophies and atrophies of the nail, pigmentations and a few other conditions are included here, for simplicity's sake although not all are dystrophic manifestations

ONYCHAUXIS AND ONYCHOGRYPHOSIS

Hypertrophy of the nail is called onychauxis It may be observed in one or more nails, but it is more frequent in the toes and particularly in the great toes The affected nail is thickened elongated raised, green or black in color, at times twisted like a spiral or hook and its surface is

always irregular and opaque In some cases the aspect is that of a claw or a horn and the texture of the nail tissue is also very much like that of the horn of an animal In the latter cases the condition is called onychogryphosis The sub ungual space and the nail bed are often filled with a brittle grayish corneous accumulation In extreme cases the nail may measure as much as 8 or 10 centimeters and in these cases the distorted nail is turned to one side or curved upon itself

Onychauxis and onychogryphosis are the most frequent of all nail dystrophies



Fig 46 Onychogryphosis unknown etiology

Another type of hypertrophy of the nails is that known under the name of pachyonychia in which all nails are affected In these cases the nails are more regular and their texture more solid than in the common cases of onychogryphosis Also the nail bed becomes thickened These cases are frequently accompanied by hyperkeratosis of the palms and soles Pachyonychia is more often a congenital condition

Onychauxis and onychogryphosis are usually observed in individuals who go barefooted, in trophic disturbances of the extremities such as peripheral neuritis in heart disease *with peripheral stasis leprosy, ichthyosis tabes and hemi* plegia Syphilis may cause nail hypertrophy in one or more fingers or toes (hypertrophic syphilonychia)



Fig 47 Ram horn onychogryphosis

Mycotic infection of the nails produces onychogryphosis according to Fisher (394) and Leone (402) Trauma is per haps the commonest cause It may be a sudden trauma, such as dropping a heavy weight on the nail, or gradual trauma, such as repeated stubbing of the toes in short shoes and especially in the wearing of high heels In England, ony chauxis used to be known as hostlers toe because of its frequency among the men who tended the horses caused



Fig 48 Onychogryphosis and onychomycosis in an old man

by the animals treading on the men s feet In some cases onychauxis may be inherited and may be traced back for three or four generations Familial onychogryphosis has been reported by Touraine and Soulignac (214) In the cases reported by these authors the nails of all toes were affected the patients also presented hyperhidrosis diffuse pigmentation dental malformations and hypertrichosis pointing to a possible disturbance of the ectodermal development caused perhaps by endocrine unbalance The patient s father was similarly affected Cases of this type are of difficult classification and whether they are examples of onychogryphosis or belong to the group of ectodermal defects or to the pachyonychia congenita may be a matter of opinion

Sometimes there is no apparent cause except senility dirt and carelessness as in the case reported by Gray and Bean (403) An hereditary type of onychauxis with atrophy of the hair has been reported

Hollander (62) has reported a case of dystrophia adiposo genitalis with onychauxis of all fingers and toes

Alderson (63) has reported a case in a woman aged forty nine in whom all the nails were affected The skin of the patient was dry and itchy There were no signs of thyroid insufficiency but the nails became normal after six months under thyroid treatment in doses of 0 06 gms three times a day

Lisser (64 has studied a case of onychauxis in a eunuch in whom implantation of a testicular graft resulted in the return of all nails to a normal condition

Pituitary and thyroid deficiency do not always produce onychauxis and Hollander (65) has reported three cases of dystrophia adiposo genitalis in one of which the nails were atrophic Bruno Bloch (66) has reported similar cases

Combes (67) has reported a case of onychauxis and onychogryphosis in a child twelve years old with symmetric palmar



Fig 49 Pachyonychia Notice hyperkeratosis of the palms

and plantar hyperkeratosis and a basal metabolic rate of minus 21.

The treatment of hypertrophy of the nails should be that of the cause when it can be found Attention should be paid to cleanliness and properly fitting shoes Disturbances of internal secretions should be thoroughly investigated and the basal metabolic rate should be determined in all suspicious cases, especially in the young

In onychogryphosis, mechanical removal of the nail may be necessary

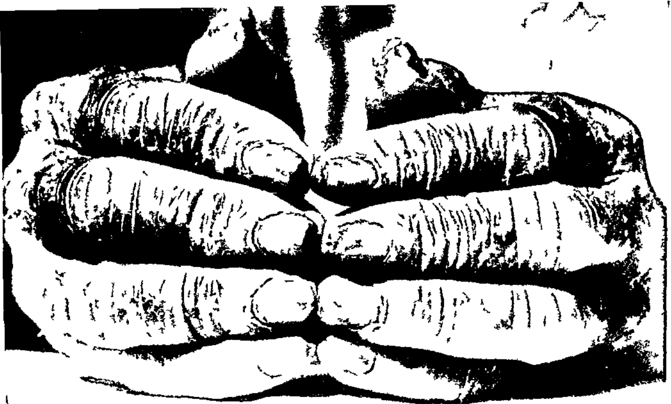
Massage with warm olive oil induces improvement in many cases of dry onychia, hyperkeratosis sub unguialis, onycholysis and many other dystrophies of the nails

In onychogryphosis and hypertrophies of the nails in general, hot baths and massage with hydrogen peroxide are very useful According to Schuetz (160) this procedure is employed by turners who put antlers in boiling hydrogen peroxide, thus bleaching them and making them malleable We advise the use of 40 per cent salicylic acid plaster for four to five days previous to the removal of the excessive growth

High doses of vitamin A," up to 600,000 units daily have been employed in cases of this type, without definite results, although some observers claim improvement It is a method worthy of trial in cases of hypertrophic nails and of pachy onychia

The treatment of onychauxis and onychogryphosis by grafting a donor's nail in the nail bed of a recipient has been attempted by plastic surgeons, but the principle of this procedure is contrary to the anatomic and physiologic facts of the growth of the nails and therefore is bound to fail in any case

Surgical removal of the hypertrophic nails with an electric drill and hand clippers, is the only logical method of local



F g 0 Lacl o y l a Not e the sol d l t reg lar appeara e f ll ls l e n s eq lly aff cte l

treatment and this procedure must be repeated at intervals as the affected nails usually keep growing unless they are radically removed and the matrix destroyed by electro coagulation

HYPERKERATOSIS SUB UNGUALIS

Hyperkeratosis sub ungualis is a symptom accompanying onychogryphosis onychomycosis onycholysis and other affections of the nails such as psoriasis and eczema

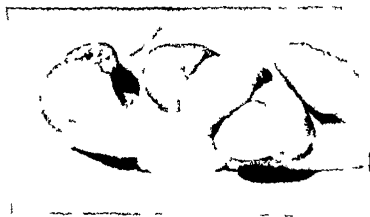


Fig 51 Hyperkeratosis sub ungualis Repeated examinations for tinea were negative

Occasionally sub ungual hyperkeratosis in the form of a gray or brown accumulation of horny matter which raises the nail is the only symptom present and in these cases there is undoubtedly a disturbance of the normal cell development of the epithelium of the nail bed the cells becoming keratinized The corneous accumulation under the nail plate is usually loose and friable and may be scraped out with a curette

Castans (68) has reported the case of a man aged thirty four who presented yearly a hyperkeratosis sub-ungualis

of the fingers, beginning in the spring, increasing until the fall and disappearing during the winter The lesions began with reddening under the distal end of the nail, invading the ungual bed and resulting in the gradual accumulation of hard, yellow, horny substance raising the nail from its bed There were no subjective sensations Examinations for fungi were negative This case is placed among the idiopathic hyperkeratoses although its seasonal character makes it peculiar



Fig 52 Atrophy of the toe nails due to pressure of faulty shoes

Treatment of these cases should be directed to the cause In severe cases the local application of a 40 per cent salicylic acid plaster causes softening of the nail plate, which can then be easily clipped The nail bed should be scraped off with a small curette In mild cases locally scraping the nail bed with a small curette and packing the resulting cavity with *strong salicylic acid paste* (15 to 20 *per* cent) may produce improvement

ONYCHATROPHIA

Onychatrophia is a diminution of the normal development of the nail in size, thickness or texture Atrophic nails are small, deformed, thinned, and sometimes do not grow to form a free edge but consist of small stumps of irregular pieces of filaments heaped up near the matrix At times the nail plate is adherent to the subjacent bed and is represented by keratinized strips alternating with bands of corneous epidermis At times only a small ungual stump remains near the root which has a tendency to grow upwards vertically In extreme cases the nail is rudimentary, the matrix

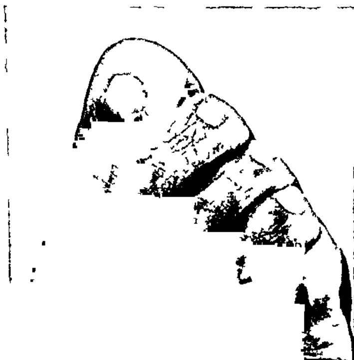


Fig 58 Atrophy of the nails in a case of hyperthyroidism.

disappears almost entirely and the finger or toe becomes a globular shaped organ resembling a drum stick without any trace of the ungual plate

Onychatrophia may be the result of trauma or infection with destruction of the ungual matrix and then only one or two nails are affected In nail atrophy due to endocrine disturbance or as a consequence of certain dermatoses or systemic diseases such as epidermolysis bullosa a great num ber or even all of the nails may be affected

Hyperthyroidism may be the cause of onychatrophia in which case the nails are small encased in the surrounding skin and the peri ungual tissues appear raised so that the nail seems sunken I have seen two cases of this nature in patients with Graves disease

Hollander (65) has reported a case of dystrophia adiposo-genitalis in a woman in which the nails were thin longi tudinally striated friable and of very slow growth

Ravaut and Monnerot Dumaine (69) have reported the case of a young girl of fifteen who presented atrophy of the nails with striations and crumbling of the nail plate These lesions had existed since the age of six in several fingers and toes Serological tests for syphilis were positive and the authors attributed the atrophy to the syphilitic infection

Bruno Bloch (66) has reported two cases of lack of development of the genital organs with atrophy of the nails In the first case the patient was a woman aged twenty two with poikiloderma like changes of the skin and the second case was one with the typical syndrome of Froelich in which the finger and toe nails were either entirely missing or were represented by some irregular corneous remains markedly curved downwards at the distal ends

Atrophy of the nails has also been reported in cases of *congenital dystrophy with pigmentation* and leukokeratosis of the mouth by Cole Rauschkolb and Toomey (70)

Sertoli (361) describes onychatrophia retinal detachment and trigeminal neuralgia as plurisymptomatic manifestations of repeated trauma in a prize fighter with congenital dismesenchymatous dysplasia

Onychatrophia may be a familial hereditary dystrophy

In leprosy atrophy of the nails is very frequent and the nail plates become mere points or irregular bands distorted into the most awkward shapes

Dystrophic lesions of the extremities in nervous diseases cachexia thromboangiitis obliterans Raynaud s disease and others affect the nails producing atrophy or usually thin and brittle nails Cessation of nail growth with resulting atrophy has been reported on all fingers and toes by Thibierge and others under the name of sideration ungueal (189)

Secondary onychatrophia may be the result of onychomycosis and onychia and paronychia of varied etiology Faulty shoes may cause atrophy of the nails by mechanical pressure which is frequent in civilized races

HAPALONYCHIA

This type of ungual dystrophy described for the first time by Kaposi consists of a softening of the ungual plate which bends easily breaks or splits at the free edge resulting in one or more longitudinal fissures

According to Heller real softening of the nails is very rare and has been observed in persons who handle strong alkalies but many affections with dystrophic disturbances of the extremities present thinning and softening of the nails undoubtedly due to defective cornification as a result of endocrine or of local or general nutritional disturbances

In this connection it may be proper to call attention to Klauder s work on the sulphur content of the nails in relation to the growth of the hair and nails According to

Klauder (71) keratin, a simple protein of albuminoid nature, is peculiar in that it has a high sulphur content, the sulphur being present almost entirely in the form of the amino-acid cystin. It would appear therefore that the metabolism of sulphur probably plays an important rôle in the development and growth of keratinized structures such as the hair and nails.

One of the most marked cases of hapalonychia seen by us was in a colored patient with multiple chronic arthritis and keratoderma blenorrhagicum. The nails were transparent, whitish, easily bent and were fan shaped, that is, wider



Fig 54 Hapalonychia in a case of chronic rheumatism Notice diffusion of the lunula

at their free border than at the base All the finger nails and toe nails were affected and presented numerous longi tudinal fissures Two more cases of chronic arthritis seen by us presented similar phenomena of the nails

We have also seen this dystrophy in cases of leprosy, myxedema, acroasphyxia and in peripheral neuritis with excessive sweating of the hands

Heller has seen cases of hapalonychia in hemiplegia and other nervous diseases

In some cases of hapalonychia the nails assume a semi transparent bluish white hue which resembles the color of the shell of an egg, and this condition has been called egg shell nail

In extreme cases the nails may become membranous due to the lack of keratin in the nail plates

Treatment of these cases is that of the general or local condition which produces the nail disturbance Here as in onychatrophia and other nail defects it may be desir able to determine the sulphur content of the affected tissue If the sulphur content is lower than normal the administra tion of hydrolized wool and a diet high in sulphur would be indicated Klauder has obtained favorable results with this treatment in some cases of abnormalities of the nails

Commercial gelatin by mouth (20 to 30 gms per day dissolved in water or fruit juice once a day) deserves a thera peutic trial in these cases in view of the excellent results re ported by Tyson (404) and others in the treatment of brittle nails

KOILONYCHIA

Koilonychia consists of a concavity in the ungual plate which becomes more apparent when the nail is viewed laterally The nail may be of normal thickness or may be thickened but the surface is usually smooth and not scaly

Due to its shape this dystrophy has also been called 'spoon nail" It usually affects several fingers but may involve all of them and more rarely all of the toes It has been observed in several members of the same family and in successive generations Crocker reported a case with co existing lichen planus and cases have been published due to acanthosis nigricans, prolonged cachexia and syphilis

We have seen a case limited to the thumb of the right hand in a patient with secondary syphilis, the deformity dis appearing under specific treatment

Fred Wise (72) has reported a case of koilonychia in a patient thirty years old in whom the affection had existed for four months All nails of both hands were affected and the deformity consisted of a well defined central depression occupying almost the entire surface of the nails, giving them the aspect of small cups with raised borders The nails were irregular, pitted, crumbling and discolored Microscopical examinations for fungi were negative In the discussion of this case Pollitzer insisted that in true koilonychia the surface of the nail is smooth

Howard Fox (73) has reported a case of koilonychia in three fingers of each hand in a man aged twenty six, an old syphilitic

Walzer (74) has also reported a case of koilonychia (spoon nail) in a child five years old coincident with monilethrix of the scalp The father also had koilonychia but his hair was normal

Koilonychia of all finger nails in a patient with monile trix was reported by Lewis (268) The toe nails were normal

Maire and Woringer (75) have recorded a case of koilony chia in a girl aged nine with dystrophies of the hair and palmar hyperkeratosis The basal metabolic rate was minus 47 and treatment with thyroid extract resulted in marked improvement

Koilonychia has also been reported in chlorosis and anemia Broeckema (77) has reported two cases of koilony chia in patients with achlorhydric anemia which were appar ently cured after appropriate treatment for the anemia with liver extract and iron Koilonychia has also been reported as part of the Plummer Vinson syndrome

Koilonychia associated with anemia has been observed by the authors on several occasions usually a few nails being affected rarely all nails of both hands We have never seen koilonychia of the toe nails Treatment with liver extract injections and iron internally results in gradual and steady improvement and finally the nails return to normal after several months



Fig 55 Koilonychia due to secondary anemia (Courtesy of Dr J M Hitch)

Oliver and Bluefarb (269) have reported an unusual case of hypochromic anemia in a woman who presented all finger and toe nails curved both longitudinally and transversely the opposite phenomenon of that observed in koilonychia

Cook and Lutz (270) report two cases of koilonychia which returned to normal after treatment for thyrotoxicosis There

was no hypochromic anemia and no reason for supposing that iron metabolism was at fault

Glazebrook (271) reports a case of policythemia vera in which koilonychia appeared on several occasions when the red blood count was high and the disease was in active phase After roentgen ray treatment reduced the red cell count the nails returned to normal Glazebrook concludes that koilonychia is probably a manifestation of an epithelia lack of iron However this is only an assumption wi basis since the chemical analysis of the nail substance shows no appreciable amount of iron

The role of trauma has been emphasiz d by Kartamischew (193) who has reported three cases all occurring in women doing housework He was unable to relate the condition to hereditary internal secretory or pre-existing eczematoid lesions Cipollaro (178) states that many cases are due to occupation especially in those who handle strong acids and alkalies It has also been observed in chimney sweeps

Passano and Botbol (272) have reported a case affecting all the finger nails in a mechanic twenty three years old The authors believe that trauma plus the constant use of oils strong soaps and naptha were contributing causes

Wyss Chodat (215) has reported a case of koilonychia of all fingers in a boy aged four The patient had grown very rapidly to adult size and the nail disturbances were attributed to this rapid development Under treatment with vitamin D and calcium salts the nails became normal after six months Koilonychia congenita has been reported by Gate and Moreau (216)

Congenital koilonychia and onychogryposis were reported by Curtiss and Netherton (273) in a girl eight years old The nails were olive brown curled at the free edge and spoon shaped There were no other ectodermal defects Cipollaro (274) also has reported a case of congenital koilonychia that had not shown any improvement in fifteen years

Koilonychia has been reported (341) occurring two months after total gastrectomy and also in cases of iron deficiency

PLATONYCHIA

Under this designation Heller in 1906 described a very rare dystrophy of the nail consisting of a modification of its



Fig 56 Convex nails The condition is the opposite of koilonychia This patient was considerably improved by treatment with thyroid extract (Courtesy of Dr L G Steck)

curvature which instead of being transverse was lengthwise with the formation of a horny disk in the center of the nail plate This condition may be congenital or acquired As a *rule it affects all the fingers or most of them*

The condition may be due to the work performed by the patient, as in a case seen by Heller in a glass worker

Masckileison (78) has reported under the name of platonychia acuta abrata the case of a man aged thirty five who had a psoriasiform eruption and lesions of the finger nails consisting of round, whitish, softened thickened spots in the center of each nail except that of the medius These spots were surrounded by healthy nail tissue, and later the lamellated friability spread to the edge of the nail The author was of the opinion that this was a manifestation of psoriasis

ONYCHOSCHIZIA

This ungual dystrophy is very rare and consists of lamination of the nail in two or more superimposed layers As a general rule the nail grows normally until nearing the free edge when it unfolds and breaks off or continues growing into two or more lamellated stratifications There is no *change in color, in texture or in aspect, although the nails* become friable due to the diminished resistance of the thinner layers into which it splits As a rule only one nail is affected and at the most two or three of them

Onychoschizia is mistakenly included in many text books under onycholysis or onychomadesis

We have seen onychoschizia in cases of eczema, as remarked by Heller but the most typical case seen by us was in a young woman who presented the condition in the first two fingers of the left hand The nails were well manicured, of normal shape and color without any inflammatory

or trophic disturbances The patient had a mild dermatitis seborrheica of the face and scalp The basal metabolic rate was normal The nails of the index and middle fingers of the left hand had split into two layers about three millimeters from the free edge an upper layer very thin whitish transparent and a lower thicker layer If the patient pared the nails the defect disappeared as long as the nails were short but on growing again the splitting invariably occurred This very thin onychoschizia has been called onychoschizia lamellina

Partial onychoschizia is rather common in women due to excessive manicuring especially in the first and second nails of both hands The free edge of the nail splits into two or three superimposed thin layers from 1 to 2 millimeters in width Onychoschizia occurring through the whole width of the free edge of the nail is less common Trauma such as caused by playing certain musical instruments piano guitar and other string instruments may cause splitting of the nail plate at the free edge

Treatment consists in avoiding excessive dryness as well as the small repeated traumas mentioned above keeping the nails trimmed short and using a daily massage with olive oil or with the same cream prescribed for fragilitas unguium The administration of small doses of thyroid extract in young women has proved helpful in certain cases

ONYCHOLYSIS

Onycholysis is the gradual separation of the nail plate from its bed beginning at the free edge and progressing slowly toward the root At times all nails may be affected but at others only a few present this dystrophy The nail may separate almost entirely from its bed but is very seldom shed

Onycholysis is a slow process, gradually progressive and should not be confused with onychomadesis or defluvium unguium which consists in the total loss of the nails in a short time beginning at the root of the nail and progressing forward



Fig 57 Onycholysis probably due to syphilis

Onycholysis is accompanied by very slight inflammatory changes or none at all and there is often thickening of the nail plate and accumulation of corneaus material underneath

Cases have been described due to circulatory disturbances of the extremities with hyperidrosis, to eczema, psoriasis and late syphilis Sometimes the nail becomes arched transversely, elevated at the free border and rolled upon itself like a Spanish tile or like a paper cone

Strauss (79) has reported a case of onycholysis in a young woman with hyperidrosis of the hands

Friedman (80) has studied fifteen cases of onycholysis partialis which he attributes to syphilis, tabes, congenital defects or to unknown causes In a case of lichen planus there was total onycholysis

Templeton (81) has reported five cases of onycholysis in bottle washers in which trauma and prolonged immersion in water may have been incriminated Insurance companies accepted liability in all cases and compensated the patients Oppenheim was the first to report four cases in housewives in 1909, probably due to the use of caustic soda



Fig 58 Onycholysis of all finger nails

Of the 485 cases of affections of the nails reported by White (11) 141 presented onycholysis and of these twenty four were of eczema fifteen due to trauma twenty-one to panaritium thirty seven to psoriasis and eleven to syphilis In our opinion the concept of onycholysis should be more restricted and used only to designate those cases of spontaneous separation of the nail from its bed progressing in a slow

manner from the free edge to the root with little or no inflammatory changes Evidently White used the term onycholysis in a broader sense including all cases in which all or part of the ungual plate was disconnected from the nail bed

Onycholysis may be found also in some cases of chronic ringworm of the nails

Bertaccini (quoted by Heller) has reported two cases due to hereditary syphilis

An interesting case of onycholysis is reported by Viecelli (186) in a leather worker, caused by traction exerted on the nail and softening of the epidermis under the free edge

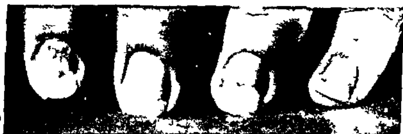


Fig 59 Onycholysis due to hypothroidism

Heimann and Silverberg (275) report on the frequency of onycholysis among workers in the fur industry who separate the corium from the fur pelt The fact that the pelts are steeped in brine and that the workers hands are wet with this solution may be an added cause to that of the friction in scraping off the soft flesh from the pelts Two mechanisms were involved in this process one mechanical and the other the maceration of the skin underlying the nail There was no infection and no pain connected with this condition The incidence of onycholysis in fur workers was as high as 76 9 per cent The use of suitable tools is suggested to prevent this condition

Stubbart (405) describes onycholysis of seven years duration in a forty year old beautician due to imbedded hairs under the nails Only after surgical removal the nails became normal

Everett C Fox (217) attributed a large group of cases of onycholysis to hypothyroidism and claims excellent results with the administration of thyroid extract

In a later personal communication Fox believes psoriasis to be the most frequent disease associated with onycholysis According to Fox thyroid medication still remains the best means of treatment in at least 80 per cent of his cases of onycholysis

We can confirm Fox s report on onycholysis due to deficiency of thyroid secretion Many of these cases do not show any other symptoms of hypothyroidism and the B M R may be normal as well as the morning temperature, however the administration of small amounts of thyroid extract causes rapid improvement and finally the nails become normal Relapses are common when thyroid medication is discontinued

Lynch and Laymon (276) in discussing a case of onycholysis presented by George Doyle before the Minnesota Dermatological Society in 1942 suggested the use of calcium and thyroid medication

Among the unusual nail dystrophies Anderson (338) has reported an interesting one The patient was a white man, aged fifty one who for nine years had a disturbance of the finger nails apparently onycholysis the right index finger nail had a complete depression in the center extending from the base to the tip of the nail both thumb nails suffered a peculiar eroding process of triangular shape No cause was found and x ray treatment was unsuccessful

Onycholysis in hyperthyroidism has been called Plummer s Nails and has been considered as a valuable diagnostic aid Luria and Asper (406) report regression of onycholysis in cases of hyperthyroidism following treatment

Dobes and Hippert (407) Darnell and Coombs (408) Fanberg (409) Winston and Sutton (410) Laymon and Rusten (411) Bereston (412) Cowan (413) Courville (414) and many other dermatologists including the authors of this book have observed a disorder of the nails produced by the application of nail base coats which are applied to the nails beneath the ordinary nail polish to prevent the latter from chipping and to reduce the frequency of application

These new formulas were modified in 1947 and the main ingredients usually present in these special base coats are solutions of synthetic rubbers The most striking changes produced by these allergenic chemicals are discoloration of the nails which may vary in different shades of brown The nails become much drier brittle and some present longitudinal striations Another important feature is the deposition of keratotic material beneath the nail which leads to varying degrees of onycholysis and in some cases to complete shedding of the nails This allergic manifestation is sometimes so severe that intense pain redness and bleeding points under the nail are the initial manifestations followed by sub ungual hyperkeratosis and onycholysis

The positive reactions to patch tests with these base coats in persons who present these nail changes suggest that this is an allergic contact dermatitis of the nail bed

Similar clinical pictures have been reported by Frumess and collaborators (415) and also by Lane and Kost (416) with the use of artificial finger nails

Treatment of onycholysis with fractional doses of roentgen rays once a week or with semi intensive doses (150 r) every other week is very helpful No more than six subintensive

treatments should be administered Cleansing and clipping of the nails to prevent accumulation of dirt and corneous material under the nails and a light massage with olive oil or with basic ointment, U S P, should be done daily In some cases there may be some inflammation due to trauma and perhaps some slight oozing due to infection with pyogenic organisms and then daily applications of tincture of zephiran or a combination of an antibiotic corticoesteroid ointment under the nails are indicated

ONYCHOMADESIS

Onychomadesis is the spontaneous separation of the nail from its bed beginning at the proximal end and progressing rapidly toward the free edge until the nail plate falls off It has also been called ' defluvium unguium and improperly "alopecia unguium ' In many cases all finger and toe nails are affected The name 'onychoptosis" given to this affection by some has been criticized by Heller (82) for ptosis means downward displacement and not loss of the organ affected, and in this sense is applied to displacement of the viscera

Onychomadesis has been observed in scarlet fever, accompanying the terminal desquamation of the disease, and less frequently in other eruptive diseases It has also been reported in extensive alopecia areata and as a consequence of trauma, dermatitis exfoliativa tabes inflammatory onychia and paronychia Syphilis should be suspected in obscure cases

Cornbleet (417) reports onychomadesis in three women with psoriasis Two of these women had multiple episodes of acute separation of the thumb nails from their beds accompanied by excruciating pains One of these women had eight nails affected in the course of three years, the other two in the course of six months In many cases the etiology remains unknown

Familial and hereditary cases have been observed as the one reported by Colcott Fox in which the patient shed his nails every year without inflammatory phenomena The mother and two uncles of the patient suffered from the same condition

Strauss (79) has reported two cases of unknown etiology and lays stress on the differentiation between onycholysis and *onychomadesis*



Fig 60 Onychomadesis in an hysterical woman Only the large toe *nails were affected The lesion on the second toe is a corn*

W J Oliver (83) has reported onychomadesis in a father and *two sons who lost their nails frequently without any* known cause The father had this experience every year

Duhring and others noted repeated falling of the nails in *epidermolysis bullosa hereditaria this phenomenon* being a common occurrence in this disease

We have seen a case of onychomadesis in a middle aged hysterical *woman without any other pathologic condition*

In the majority of cases of onychomadesis the nails begin to grow immediately after the fall of the deciduous plate and they apparently grow normally but in relapsing cases the nails may finally atrophy and disappear as is the case in epidermolysis bullosa

Onychomadesis seems to be due to an arrest of function of the nail matrix which lasts long enough to deprive the nail of its nutrition

LEUKONYCHIA

Leukonychia is one of the most common phenomena observed in the nails It consists of the development in one or more nails, of white puncta or striae always disposed in a transverse direction to the axis of the nail plate This is



Fig 61 Leukonychia striata

called leukonychia punctata and striata In certain rare cases the nails may be totally white from the lunula to the free border, the condition being called leukonychia totalis We have seen a case in which leukonychia was present in exactly half the nails of the great and second toes in a colored man in whom the condition seemed to be congenital

The finger nails are the most frequently affected, the toes very rarely In common parlance these lesions are attributed to "lies" told by the patient They are also called "gift spots"

The white spots develop rather suddenly and rarely increase in size but progress with the growth of the nail until they are finally eliminated at the free edge



Fig 62 Congenital leukonychia affecting half the first and second toe nails Several members of the family were said to be similarly affected

Leukonychia is not symptomatic of any particular organic disease Trauma is supposed to be the cause in many cases, producing small fractures in the cellular compact of the nail and permitting air to collect between the cells, with the resulting white discoloration Manicuring excesses and repeated pressure on the free edge of the nail have been incriminated (MacKee, Lane, Whitehouse, Rulison (84) It is a well known fact that leukonychia striata occurs more often in women who frequently manicure their nails while it is rare in men who perform manual work Repeated trauma with the orange stick, over the nail matrix has been incriminated by some

Some investigators have demonstrated the presence of imperfectly cornified cells in the white spots and the presence of numerous granules of keratohyalin and nucleated cells which would account for the white color and would explain the easy separation of these cells from each other under slight traumatism, due to the lack of cohesion of these cells The white color would then be the result of the presence of granules of keratohyalin and not to the presence of air between the cells Alkiewicz (198) attributes the change of color in leukonychia to the presence of intracellular granules, regularly situated in the protoplasm These granules are of a yellowish color, but appear white due to an optical effect of refraction According to Alkiewicz the chemical study of these granules shows that they are not composed of keratin, fats, calcium salts or cystine These corpuscles are insoluble in alcohol, ether, anilin oil, benzol, strong acids and alkalies They give a positive dopa reaction and thus seem to be similar to melanin

Mitchell (418) inspected his finger nails daily and chartered the position and size of each leukonychial spot that appeared in one year During this time one hundred and fifty two leukonychial spots appeared of which the complete history

was studied Eighty three appeared over the lunula and twenty two on the rest of the nail, whereas fifty disappeared before reaching the free edge, fifty five grew to the free edge of the nail

The author's histologic studies indicate that at least some *leukonychial spots are areas of imperfect keratinization in* which the cells retain nuclei and granules (parakeratosis) Since about 50 per cent of leukonychial spots disappear during their progress towards the free edge of the nail, it would seem that the parakeratotic cells can mature, lose keratohyalin and form keratin, up to 100 days after their formation

The appearance of leukonychial spots distally to the lunula, suggests that the cells of the nail bed apparently participate in keratin formation so that from time to time a group of cells is enclosed while still nucleated into the nail plate

The increase in size of leukonychial spots observed by Mitchell may be explained by the entrance of air between parakeratotic cells, shriveled as the result of trauma

Trauma does not appear to be the sole cause of leukonychial spots, since no areas of this type were found on the toe nails Moreover it was thought that if the spots were due to trauma they would be uncommon on the newly born, the finger nails of 65 babies examined during the first week after birth revealed no leukonychial spots in any case On the other hand, it is quite common to see leukonychia striata on the nails of babies within the first three weeks of birth and the lines usually correspond to the *date of birth*

According to Sabouraud (85) leukonychia is of important prognostic value He believes that leukonychia is found in weak, tired, nervous persons particularly in women and that it is often an early sign of tuberculosis In our experience there is no clinical or pathologic foundation to justify

this belief Leukonychia is not found more often in patient with tuberculosis than in others who are apparently normal

Josephson and Lerner (166) believe that in persisten catarrhal conditions leukonychia, among other manifesta tions, is symptomatic of a constitutional metabolic disorde which responds to high doses of ammonium chloride and t other substances which effect a shift of the acid basic balanc in the direction of acidosis

Uhrbach (277) has reported a case of white cross striae o the finger nails following cardiac infarction The conditio appeared fifty five days after onset of infarction Uhrbac

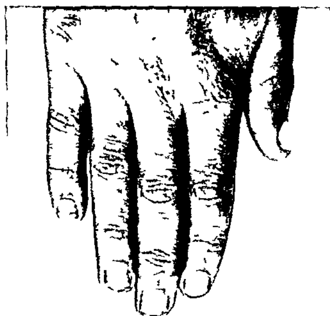


Fig 63 Leukonychia totalis (Courtesy of Dr Howard Fox)

attributed the condition to inadequate blood supply of the extremities during the circulatory emergency

Cardiviola and Bustamante (278) have reported a case of leukonychia striata affecting all finger and toe nails in a woman aged twenty three, who suffered from nervous depression and asthenia, the nails were examined two months later and still showed transverse white bands

Leukonychia striata semilunaris has been reported by Costa (279) in a mulatto farm worker who also had secondary anemia and had suffered measles four months before The finger nails showed a white crescent shaped area covering the anterior half of the nails and apparently growing away with the nails towards the free edges

Familial leukonychia has been described by H C Samuel (86) who refers to the case of a boy aged six who presented

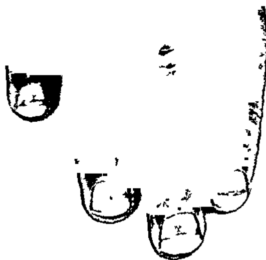


Fig 64 Leukonychia striata semilunaris (Courtesy of Dr Osvaldo G Costa)

leukonychia striata and lesions of leukoderma and melanoderma arranged in lines in the costal and lumbar regions An older brother had leukonychia striata, and the father had leukoderma and melanoderma of the face and leukonychia of the finger nails, and finally an uncle presented leukonychia striata of all finger nails

S W Becker (87) has reported a case of congenital leukonychia in which histologic examination showed the presence of nucleated cells in the white spots The nuclei as well as the protoplasm of these cells stained well with acid dyes and there was a stratum granulosum in some places Treatment by roentgen rays resulted in an exaggeration of the condition in the only nail thus treated

According to Paul Singer (88) of 100 normal persons examined 58 per cent of the men and 75 per cent of the women presented leukonychia The theory of the inclusion of air between the cells is based according to him, on erroneous interpretations Singer believes that the process of keratinization is the result of decreased metabolism of the germinal layer and that any increase in the metabolic rate will retard the process of keratinization and consequently keratohyalin granules will appear in the nail plate Keratohyalin appears white through the nail plate due to its power of refraction

According to Heller leukonychia may be due to trauma or may be the result of constitutional disturbances, while in many cases the etiology remains unknown Krantz (146) and Adler (147) have reported transverse white lines of the nails as a result of thallium poisoning

Thal (419) reports three cases of leukonychia in workers in the meat industry due to saltpeter brine

Leukonychia totalis is very rare It may be congenital and hereditary Heller cites cases due to trophic disturbances of the extremities and to arsenical poisoning

obliteration of vessels Senile cutaneous changes including merging of elastic and connective tissue in the cutis may also be present

Ronchese (421) considers onychorrhexis a manifestation of senility and states Only occasionally have I seen longitudinal striations in the young



Fig 65 Onychorrhexis in a case of peripheral neuritis Notice pterygium at the base of each nail

Kauffman (quoted by Ronchese) studied a group of 500 men and women between the ages of eighteen and thirty five and found 8 4 per cent with recognizable longitudinal striations of the finger nails and 7 6 per cent with striations of the toe nails Histologically Kauffman found the ridges to correspond to projections of the nail bed The author concludes that onychorrhexis is common and of no significance

Simple onychorrhexis should not be confused with that observed in onychomycosis in which the nails appear reedy

partially destroyed and worm eaten, or with fissures due to trauma of the matrix, which persist through life and as a rule are solitary lesions

Nobl, Sprinz, and Freche quoted by Heller, have reported hereditary familial cases

In some cases onychorrhexis may be symptomatic of eczema, psoriasis, onychomycosis, trophic disturbances of the extremities, nervous diseases, leprosy and lichen planus

We have observed this dystrophy in laboratory workers whose hands come in contact with strong solutions of formal dehyde, alkalies and other chemical substances In these cases at least, it is possible that these chemicals dissolve the natural lipids of the nails (cholesterin) resulting in dryness and splitting

BEAU S LINES

Transverse lines in the form of sulci limited posteriorly by slightly elevated ridges were described by Beau in 1846 as retrospective signs of a number of pathologic conditions

These lines appear at the lunula and progress forward with the growth of the nail until they disappear at the free edge As a general rule the sulcus is rather superficial and the nail continues its normal growth, but occasionally the trans verse linear depression affects the whole thickness of the nail dividing it into an anterior discolored, deciduous por tion and a posterior normally growing nail The anterior part of the nail becomes dead and separates from the bed, finally falling off In many cases numerous Beau's lines may be observed giving the affected nail a wavy appearance One or many or even all the nails may be affected, the most frequent being the great toe nails

This phenomenon is frequent after infectious diseases, traumatism of the extremities, psychic disturbances, nervous shocks, childbirth diabetes cardiac infarction, intermittent

claudication and trichinosis It has also been reported in patients suffering from eczema psoriasis diffuse alopecia dermatitis exfoliativa and *in many other conditions*

Cook (281) reports a case of dermatitis exfoliativa due to sulfathiazole administered internally for impetigo of the face In this patient a young Negro all the nails of the fingers and toes were thickened and showed transverse furrows which appeared about five millimeters apart

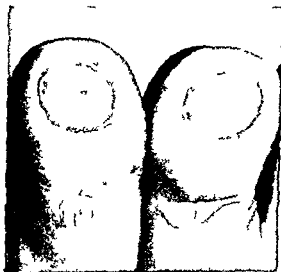


Fig 66 Beau s lines Three months after severe influenza

This phenomenon is common in all cases of dermatitis and may be observed quite frequently in cases of dermatitis venenata as well as in cases of *dermatitis due to systemic* causes

D W Montgomery (90) has reported a case of Beau s lines affecting *all the finger nails after* an attack of acrocyanosis of the hands during exposure to severe cold

According to Speransky (91) transverse sulci appear frequently in the new born about the fifth week after birth

They have nothing to do with syphilis They seem to be the result of trauma during childbirth and are particularly frequent in cases in which forceps and other manual or surgical measures were employed Towards the eighth week they reach the middle of the nail and by the end of the third month they may reach the free edge This is quicker than the growth in adults, in which between four and five months are required before Beau s lines reach the free edges of the nail plates

Beau s lines are due to a sudden arrest of the function of the matrix, which may be more or less prolonged, and which results in the cessation of production of normal nail cells



Fig 67 Multiple Beau s lines The lines are so close that the proximal part of the nail appears wavy The distal half of the nail is being cast off after losing its connection with the nail bed

This causes the formation of a hiatus in the continuity of the nail plate When the etiologic factors act repeatedly, multiple Beau s lines result

The presence of Beau s lines may serve to ascertain the approximate date of the occurrence of the disturbance for since the nail plate takes approximately 160 days to grow from the matrix to the free edge, the location of the defect may tell with some certainty the moment in which the arrest of function of the matrix took place

DYSTROPHIA MEDIANA CANALIFORMIS

This is a rare dystrophy described by Heller (92) in a young man aged twenty who had longitudinal grooves of ten years duration occupying the center of both thumbs from the lunula to the free edge The nail bed was normal Heller discards the possibility of its being a symptom or type of eczema and believes that it is a form of dystrophic anomaly perhaps of nervous origin affecting the normal process of keratinization of the nail at a certain point of the matrix

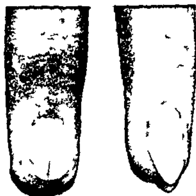


Fig 68 Dystrophia mediana canaliformis (Heller) in a young woman

Wucherpfenning (93) has reported another case affecting both thumbs in the form of a canal of from 4 to 5 mm along the center of the nails and accompanied by lamellar desquamation Roentgen ray treatment was successful

E Ledo (94) has reported another case in detail and claims to have described a similar case years before

Costa (282) has reported a case in a Negro soldier with only one nail affected, that of the left ring finger, the condition had been present for 10 years

Fowle and Wiggall (283) have reported a case of this dystrophy on both thumb nails, which cleared after removal of infected teeth Other nails of the same patient were abnormal, with onychorrhexis, onychogryphosis and sub ungual hyperkeratosis

Similar lesions were present in a patient of Krause (284) on the left great toe nail and in another following an infec tion of the third finger

Good illustrations of this dystrophy are shown in *Corpus Iconum Morborum Cutaneorum* (285) presented by Gottron, Stuhmer and Nekam In these cases the thumbs were affected

Robinson and Weidman (337) report a case of dystrophia mediana canaliformis in a white girl aged twelve The histologic examination showed parakeratotic cells with gran ules of melanin The presence of melanin pigment is an unusual finding and probably due to the presence of a pig mented spot in the nail matrix growing forth with the nail bed

Ronchese (421) has collected a group of fourteen cases of dystrophia mediana canaliformis In four such cases the longitudinal groove was located distinctly laterally (dys trophia lateralis canaliformis or dystrophia unguium latero sulcata) Six cases were definitely traumatic in origin, in three the patients had a vague recollection of injury in the past and five patients emphatically denied any injury

Sweet (422) reports a thirty three year old white man who had five or six consecutive attacks of dystrophia mediana canaliformis on both thumbs In each, the same nails were affected and cured spontaneously in a period of six to eight months There was no family history, previous illness, local inflammation or trauma

We have seen a case of dystrophia mediana canaliformis in a woman twenty five years old in the form of a central canal of five years' duration ending in a fissure at the free edge This affected the middle finger of the left hand, the central canal extending from the root to the free edge The patient presented no general disturbance of health and all other nails were normal There was no history of trauma In this case roentgen ray therapy was used without success

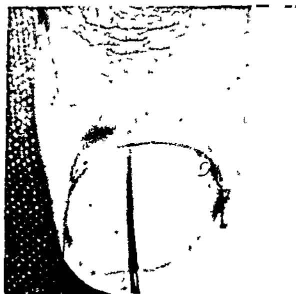


Fig 69 Dystrophia mediana canaliformis (Courtesy of Dr Murray M Robinson)

Another peculiar case observed by the authors was that of a fifty eight year old white man in which the condition began at the edge of the right thumb nail progressing rapidly toward the nail matrix A normal nail grew spontaneously a few months later There was no previous nail injury

PIGMENTATION OF THE NAILS

Pigmentation of the nails may affect all finger and toe nails or only one or a few of them At times the entire nail is affected but more often the coloring occurs in spots or bands



Fig 70 Pigmented band of the nail plate in a white man

Partial pigmentation of all finger nails is often observed in surgeons who use mercurial solutions for disinfection of their hands It is a gray discoloration probably due to the formation of mercury sulphide Callaway (218) was able to produce this discoloration experimentally He states that the deposit of mercury sulphide is activated by exposure to light

Sometimes the cause of pigmentation escapes the observer In a personal case, that of a Negro woman aged fifty there were in all finger nails transverse bands of violet color, the cause of which could not be ascertained This type of pigmentation has been reported as due to the use of laxatives containing phenolphthalein

Under the name lunula cyanea Andrews (286) has reported a similar case in which the lunula of the finger nails showed a bluish discoloration that looked like cyanosis The etiology remained in doubt as the patient gave no definite history except possibly the use of packs of a silver salt solution in her nose

In the colored races the presence of longitudinal pigmented bands or lines is very frequent Longitudinal bands of melanotic pigment have been observed in several cases in white persons and they are probably due to the presence of pigmented nevi in the nail matrix We have seen a case of this type in a young man in whom the pigmented band was congenital

In cases of chronic arsenical poisoning the nails may



Fig 71 Pigmented band of the nail plate in a full blooded negro

show dark pigmentation of the same hue observed in the skin lesions

Althausen and Gunther (164) have called attention to the diagnostic value of white transversal bands on the finger and toe nails in sub acute and chronic cases of arsenical poisoning These bands are due to the actual deposition of arsenic on the nails Simons (219) directs attention to the fact that in arsenical poisoning particularly in cases of polineuritis the appearance of diagonal white stripes—called Mee s stripes—on the nails is a characteristic sign Not only are these stripes helpful for the diagnosis but, by taking into consideration the average rate of growth of the nails, it is possible also to determine the time when poisoning took place

Borda and colaborators (423) report the appearance of white transversal bands in all finger and toe nails eight weeks after an acute attack of arsenical poisoning In this connection it is proper to remark that in arsenical dermatitis due to the arsphenamines we have not observed these or similar nail discolorations

In argyria the nails may also show the typical slate blue discoloration M F Criado (95) has reported a case of

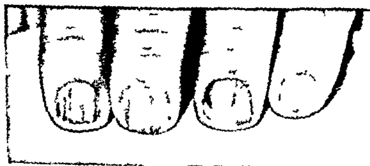


Fig 72 Multiple pigmented lines in a mulatto woman All members of her family were said to be similarly affected

lupus erythematosus with lesions of the nasal mucosa treated by local applications of a 2 per cent solution of silver nitrate which developed blue black spots with metallic reflections on the finger nails No other lesions were found on the skin These spots were eliminated with the growth of the nails

Wright describes in patients suffering from argyria the presence of a bluish gray discoloration on the nail bed along the distal margin of the lunula The bluish gray deposit spreads under the nails in a gradual manner coinciding with the appearance of symptoms of argyria elsewhere on the skin This phenomenon is according to Wright the earliest manifestation of argyria and its presence should be an indication for the immediate discontinuation of any preparation containing a silver salt (161)

Chrysarobin and resorcin used therapeutically in psoriasis and eczema may stain the nails a pale orange or a peculiar yellowish red

Loveman and Fliegelman (424) have observed that the orange-yellow discoloration of the finger nails in patients using resorcinol lotions is seen only in patients with lacquered finger nails In a group of eight subjects this peculiar discoloration of the finger nails took place when the tested individuals started using nail lacquers including one hypoallergic brand (with or without color) The same phenomenon was seen also in the toe nails All patients were patch tested to nail lacquer as well as to resorcinol monoacetate and none was found to exhibit allergic response

In onychomycosis paronychia staphylococcica and in some ungual dystrophies particularly onychauxis the nails may be colored black brown green gray or yellow The nature of these pigments it not known A dead nail always changes color and becomes black gray yellow or green probably due to some chemical alteration in the composition of the nail

Goldman and Fox (287) have reported two cases of greenish pigmentation of the nail plates from Pseudomona areuginosa infection The patients had paronychia due to this pigment producing bacillus The nail plates were green and in one case the pigmentation persisted for 6 months

Reddish brown and also some shades of orange discoloration have been observed in women s nails in recent years due to some nail enamels The pigment stains the nail substance quite deeply so that it disappears only with the growth of the nail plate scraping off the surface shows no change as the substance of the nail is deeply permeated by the stain

D W Montgomery (96) has reported a case of a bluish black band of discoloration 3 mm in width in one of the finger nails of a violinist and attributed it to the presence of a pigmented nevus in the matrix

Templeton (97) Ochs (98) and others have reported similar cases in persons of the colored race but this phenomenon is not rare in this race as we have stated before and it is probably a result of pigment accumulations in the nail matrix

These longitudinal bands of melanotic pigment may be the point of origin of malignant melanomas as in the case reported by Engman Mook and Engman Jr (57)

Sutton Jr (425) attributes transverse band pigmentation of the finger nails in a forty seven year old negro laundress to the application of roentgen ray therapy for chronic eczema of the dorsa of the hands and fingers The author suggests that these pigmented bands may be caused by the presence of melanophores under the epithelium of the nail matrix or nail root

A longitudinal black band was produced by a growth of acrothecium niger in a case reported by Young (163) The

trephining of small holes on the nail substance seemed to effect a cure

Heller cites cases of pigmentation of the nails consecutive to the pigmentary syphilids and also a case of semicircular concentric pigmented bands of all finger nails in a person suffering from quartan malaria

Campbell (99) has reported a case of dark blue pigmentation of the nails due to phenolphthalein

H M Thomas Jr (100) has reported a severe case of transverse bands of pigment involving the finger nails in a negress suffering from intense hyperthyroidism These bands appeared suddenly after treatment with radium had been used on the thyroid gland

Heller also reports a permanent yellow discoloration of the nails in a case of icterus due to carcinoma of the liver

Bearn and Kusick (426) present two cases with hepatolenticular degeneration of the liver (Wilson s disease) in which the lunula of the nails of the hands exhibited a distinct blue discoloration which may be related to the known disturbance in copper metabolism that occurs in this disease A similar case is reported by Scheinberg

White transversal nail bands have also been described in malaria by Brownson (427) and Heller (428) in cardiac infarction by Urbach (429) and in Hodgkins disease by Ronchese (430)

In Addison s disease the nails may be pigmented black or dark gray Pigmentation of the nails in Addison s disease has been reported by Mulzer and Schmalfus (162)

Terry (431) calls attention to a pale narrow zone running transversely across the distal portion of the nail bed in normal persons This Onychodermal band is 0 5 to 1 5 mms in width and immediately proximal to the free edge of the nail *Of 2,500 patients examined in nine this onychodermal band was much more prominent than usual five*

had hepatic cirrhosis and one each thyrotoxicosis pulmonary eosinophilia, malnutrition and generalized keratosis This band the author believes is more related to the adjacent skin than to the nail bed It seems to have a different nerve and blood supply The significance of this band is not known, but Terry suggests a possible endocrine etiology

Hemorrhages of the nails may leave a permanent black discoloration due to the deposit of reduced hemoglobin In these cases the black spot usually disappears with the growth of the nail

Gold therapy may cause brownish black discoloration of the nails as in the case reported by Simmons, (241)

ONYCHOPHAGIA

The habit of biting off the edge of the nails in persons of nervous temperament or in degenerates may produce deformities of these appendages The free edge disappears and the nail sinks into the surrounding tissues The skin of the lateral grooves and of the tips of the fingers becomes raised and sometimes macerated and inflamed due to the constant contact with the saliva These chronic paronychias rarely become acute and panaritium is not more frequent in these than in other persons Hangnails are very frequent in these cases A similar condition is 'onychotillomania" in which the patient picks or tears a nail, usually that of the little finger

Treatment of onychophagia is by means of psychotherapy and in small children the local use of a bitter substance such as tincture of aloe may discourage the habit In adults onychoplagia is an irresistible habit very difficult to eradicate

USURE DES ONGLES

The French dermatologists have described this peculiar wasting of the free edge of the nails in persons with chronic pruritus due to constant scratching

The free border of the nail becomes shorter in the center appears polished rounded and finally may present a central concavity The wasting may affect the outer surface of the nails to a certain extent and then the distal ends of the nails are polished and bevelled In all these cases the surface of the nails is shiny due to the continuous friction

This condition has been observed in prurigo chronic eczema dermatitis exfoliativa phthiriasis and many other chronic itchy dermatoses

HIPPOCRATIC NAILS

This is a deformity of the nails and of the end of the fingers and toes affecting all the tissues of the extremities including the terminal phalanges It is found in cases of chronic respiratory and circulatory diseases with functional difficulty and passive congestion of the extremities

It is frequent in tuberculosis but it is also seen in tumors of the lungs and in chronic heart disease

The nails are enlarged together with the ends of the fingers and toes and appear lustrous curved in the shape of a cupola hard thickened but without change in color The curving of the nail is exaggerated both in the lateral and antero posterior aspects and at times the free border is strongly curved downwards The extremities of the fingers and toes appear like the end of drum sticks (drum stick fingers) Hippocratic nails are sometimes called *watch glass nails*

As a rule all the finger nails are affected and at times finger and toe nails simultaneously

This deformity is usually permanent but in some cases retrogression may take place and even complete disappear ance We have seen this occur in cases of chronic tubercu losis in which the patient has been apparently cured



Fig 73 Onychophagia Notice pterygium of index finger of right hand



F g 74 H ppocrat c na ls in a case of chron c tuberculos s

Sometimes the clubbing of the fingers begins on one hand, but sooner or later the fingers of the other hand become affected Unilateral hippocratic nails have been reported, but these cases are very rare Aortic and subclavian aneurism and injuries to the bones or to the nerves of the extremity, may cause unilateral clubbed fingers, due to obstructed circulation, edema of the soft tissues and dystrophies of the affected parts

Kurt Weiss (288) describes the changes he has observed in pulmonary diseases, diseases of the circulatory system, gastrointestinal diseases, infectious diseases, diseases of the nervous system, diseases of the blood and industrial poison ings He states that clubbed fingers may be an early sign of lung tumors, that unilateral clubbed fingers may occur as sign of aneurism of the aorta or of the subclavian artery, that watch glass nails are attributable to disturbed resorp tion of iron and are especially common in endemic sprue

Clubbed fingers has also been described as a hereditary phe nomenon in apparently normal persons, and in some cases as being unilateral One may assume that the ancestors of a healthy person with clubbed fingers had tuberculosis emphy sema or cardiac disease

In speaking of the ungual manifestations of tuberculosis we shall again refer to this deformity of the nails

FRAGILITAS UNGUIUM

A common complaint particularly among women, is brittleness of the nails Aside from fragility of the nails due to pathologic conditions there are many cases in which apparently normal nails break off at the free edge, the fracture affecting the total thickness of the nail or only a few superficial layers leaving a chipped or flaked edge This is particularly frequent when the nails are trimmed or filed to a triangular shape

The cause of brittleness in these cases is excessive and too frequent manicuring The constant use of colored enamels and of ethyl acetate or acetone to dissolve them, produces excessive dryness and consequently the nails lose their elasticity Cuticle removers which consist of solutions of potassium hydroxide are also contributing factors Other solvents which may be equally injurious are butyl acetate, amyl acetate, absolute alcohol, normal butyl alcohol, glycol ethers, toluene, xylol, and naptha The irritating effect of the nail lacquers has been attributed to the formation of acetic acid in the solvent (220) According to Prosser White (221), amyl acetate as a solvent may liberate nascent acetic *acid which is injurious to the nails and may cause dermatitis* of the fingers

Wolcott (289) in an investigation of twenty five cases, all in business women using the same brand of nail enamel, found that nearly half of the group showed brittleness and splitting of the nails in some degree, while the other half of the group were able to wear the polish without any trouble

According to Silver and Chiego (290) fragilitas unguium cannot be ascribed to any single factor In a survery among 1,000 women they found it most common among housewives suggesting that soaps and other chemicals used in the home house cleaning and cooking may be blamed Iron medication may improve fragility of the nails

The treatment of this condition consists in avoiding the too frequent use of manicuring preparations, bathing the affected fingers in warm water followed by massage with olive oil Several weeks are required before the nail plates regain their normal consistency and elasticity

Local massage with the following formula has proved useful for the treatment of brittle nails

℞

White wax	1 0 gm
Lanolin	10 0 gm
Oil of sweet almonds	10 0 cc

Applications should be made nightly with a one minute massage on each of the affected nails Avoidance of alkalies, chemicals, trauma and other irritants are an essential part in the treatment of brittle nails

Oral administration of small amounts of thyroglobulin tablets and high doses of vitamin 'A are prescribed in some cases with good results

Tyson (404) reported benefit in twelve women with fragile, splitting nails with longitudinal fissures, after the administration of gelatin 7 0 gms daily by month Rosemberg (432) and Oster (433) followed Tyson s advice giving gelatin 7 0 gms daily for fifteen consecutive weeks to thirty six patients with brittle nails twenty six improved after three months so that their nails could be manicured to a certain point Improvement was striking in five patients with psoriatic nails

Gelatin is not a complete protein food, since it lacks tyrosine cystine and tryptophane However it is a scleroprotein containing most of the same aminoacids as keratin and has a high percentage of glycine an aminoacid with a high specific dynamic action and capable of increasing peripheral temperature (Charles F Wilkinson, Jr, 434)

In our hands Tyson s therapeutic approach for the treatment of brittle nails with gelatin per os has proved disappointing in several cases

Fragilitas unguium is also observed in cases of syphilis, diseases of the nervous system and as a symptom of several of the onychodystrophies In certain occupations the action of chemical substances on the nail may also cause brittleness

TRACHYONICHIA

Alkiewicz (435) describes a peculiar lesion of the nails observed in three cases The nails were opaque corrugated and covered by lamellae The lunula were not visible and some of the nails were spoon shaped Contact with strong chemicals was suspected in two cases in the third cause was not known

Histologically the distal portion of the nail matrix appeared normal with mild intercellular infiltration of the proximal part While the nail bed and the nail plate in their basal portions were normal the rest of the nail plate was hyper chromatic Three different types of cells were seen hyper chromatic protoplasm with normal nuclei protoplasmatic cells with highly stained nuclei and protoplasmatis cells filled with keratohyalin Another characteristic were numerous fissures especially in the superficial layers in which two signs of inflammation occurred exocytosis and exoserosis Oval foci containing serous inflammation and leukocytic migra tion and a few microabscesses were found

Alkiewicz considers trachyonichia as an inflammatory con dition of the proximal portion of the matrix which produces the superficial layer of the nail plate This inflammation alters the process of nail formation The lesion must be differentiated from onychorrhexis which is a much deeper disturbance

Chapter V

UNGUAL MANIFESTATIONS OF DERMATOSES AND OF SYSTEMIC DISEASES

Cutaneous diseases may present nail symptoms together with those of the general surface of the skin This is usually the case in those conditions which affect the keratinized structures such as the corneous layer and the hair The nails being differentiated epidermic structures suffer from the same pathologic processes as the epidermis from which they are derived

At times the lesions of the nails are an indirect consequence of the inflammation of the skin and directly due to the nutritional or trophic disturbances occasioned by the neighboring inflammation on the matrix In this case the ungual lesions are not characteristic and their diagnosis is difficult

At times the condition of the nails is directly due to local effect of the dermatosis on the ungual plate as in psoriasis or ichthyosis In such cases the pathologic lesions are similar to those found in the skin (parakeratosis hyperkeratosis etc)

Many systemic conditions such as syphilis and tuberculosis may cause ungual manifestations either directly or indirectly due to disturbances of circulation innervation and nutrition

PSORIASIS

The lesions of the nails due to psoriasis are usually observed in extensive cases particularly in psoriasis eryth

rodermiformis and psoriasis arthropatica, but there are cases in which the cutaneous lesions may be very slight or even entirely lacking, when the nail lesions constitute the only apparent sign of the disease

Approximately 15 per cent of our cases of psoriasis presented nail lesions

As a rule several nails are affected and in very extensive cases all finger and toe nails may be attacked The simplest manifestations are dryness and loss of luster due to parakeratosis similar to that which occurs in the epidermis, so that the nails become whitish due to the very fine lamellar desquamation This process affects the nail plate uniformly or may begin at the free edge and progress gradually toward the root with the formation between the plate and the bed



Fig 75 Psoriasis of the skin of the fingers and multiple Beau's lines

of corneous accumulations producing a thick, friable, yellowish mass The nails thus affected become raised and separated from the bed, deformed and broken and may fall off in part or in their entirety At times the lesions of the fingers may secondarily affect the nutrition of the matrix with the forma

tion of multiple Beau's lines which give the nail an undulated aspect

The most characteristic nail lesion in psoriasis is observed in cases of moderate severity and consists of numerous small, punctiform depressions (onychia punctata) They are at first scaly and later smooth and may show a certain regularity resembling the external surface of a thimble They may be compared to the pricks of a needle on a wax surface and present roughly the same shape and size Sometimes the points are arranged in a transverse line and divide the nail into two apparently normal portions These lesions are most frequent in psoriasis and may be occasionally seen in chronic eczema dermatitis exfoliativa and other inflammatory skin

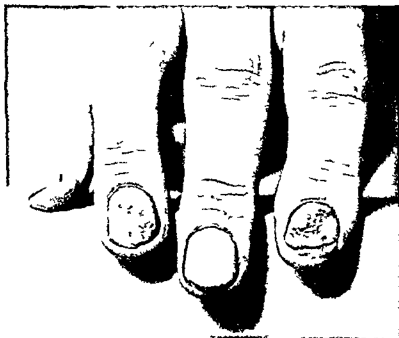


Fig 76 Psoriasis punctata of the nails of the index and ring fingers



Fig 77 Psoriasis palmaris and chronic onychia

diseases Schutz (200) describes as typical of psoriasis a series of vivid red puncta situated on the posterior third of the lunula

In psoriasis erythrodermiformis, complete loss of one or more nails may be observed (onychomadesis)

In chronic inveterate psoriasis and in arthropatic psoriasis the nails are scaly, worm eaten, striated, partially separated from the bed, with sub ungual hyperkeratosis and in some cases may be either hypertrophic or atrophic

Crawford (223) has called attention to the changes in color of the psoriatic nails The discoloration starts with loss of luster, after which transparency decreases until complete opacity occurs, and the variation in color ranges from pure white through various shades of yellow to brown, sometimes a dark blackish brown The predominant hue is yellowish brown In Crawford s cases of psoriasis the nails were affected in 49 8 per cent, a higher percentage than that of any other observer

Herxheimer and Uhlmann (101) have reported a case of cupoliform depressions of several finger nails in a patient with psoriasis The authors attribute the condition to trauma due to the occupation of the patient who carried heavy loads on his back held with both hands in such a way that pressure was constant on the matrix and the free edge of the nail The condition disappeared after the patient gave up his work A similar case was found in another man who worked at the same trade

In psoriasis pustulosa the nails may be the seat of a chronic paronychia with secondary destruction of the nail plate This paronychia presents the crusted lesions and small, numerous abscesses typical of this type of psoriasis

Alkiewicz (328) has described changes in the nails of psoriatics similar to those observed on the skin, that is, para keratosis which he calls paraonychosis The nail cells are



Fig. 78 Onychia chronica psoriatica in a case of psoriasis arthropatica



Fig 9 Psoriasis of the nails in a Chinese with universal eruption

detached separated from each other and retaining an elongated nucleus parallel to the surface of the nail the protoplasm is filled with small grains probably of keratohyaline These cells can be stained with anilin dyes in contrast with the almost colorless normal nail cells Alkiewicz also reports leukonychia due to psoriasis in the form of very fine misty striae only visible after applying a drop of cedar oil on the nail

The treatment of psoriasis of the nails is the same as that of the disease *Strong reducing agents and roentgentherapy* in fractional doses give the best results but psoriasis of the

nails often proves very refractory to treatment. Chrysarobin in collodion in 5 to 10 per cent strength, applied in the form of a film over the nail may be the best local application, in combination with hot soapy baths and mechanical removal of the corneus debris

Arsenic in chronic cases, and in certain cases the internal administration of thyroid extract may prove beneficial Bloch advises a vegetarian diet

ECZEMA

The ungual changes in eczema are polymorphous and affect one or more often several of the nails They occur as a rule only with eczema of the hands and feet, though generalized eczema may also show dystrophic disturbances of the nails



Fig 80 Chronic onychia and paronychia in a case of extensive dermatitis seborrheica

In eczema, the nails present the earliest manifestations at the root and progress to the free edge, but at times the entire nail plate seems to suffer at once Often the ungual lesions are preceded by eczematous paronychia

The diseased nails are irregular scaly with transverse ridges and at times are split longitudinally (onychorrhexis) Their color is altered and may be yellowish green gray or black The nails thus affected are brittle and break off easily presenting an appearance as if eaten by insects In chronic cases there may be hyperkeratosis sub unguahs and even of the periungual grooves

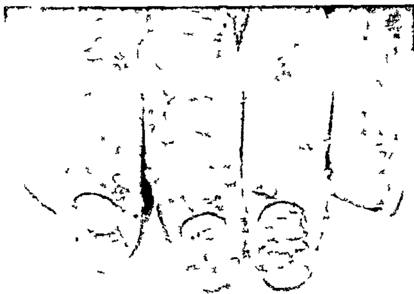


Fig 81 Acute eczema with lesions of the nails

In acute cases the most marked manifestations are those of inflammatory paronychia with secondary pyogenic infection This paronychia may be the primary manifestation in many cases followed by lesions in the nail proper The nail plates scale off become flaky crumbly sometimes divided into two or more layers (onychoschizia) and may also present

heaped up stratifications Serum or sero-pus may collect between the separated nail cells and the nail presents a crusty appearance and a penetrating foul odor, characteristic of macerated epidermis



Fig 82 Shedding of the nail (onychomadesis) in a case of chronic eczema

As a consequence of these inflammatory changes the nail plates may fall off in part or wholly and are usually replaced one or more times by more or less distorted nails which may persist or may finally be replaced by normal nails The nails may also become atrophied and even disappear entirely in chronic inveterate cases or in cases with incessant relapses though this is a rare occurrence As a rule the nails finally become entirely normal without any trace of the former inflammation

Dermatitis venenata type is frequent in persons who handle irritating or allergizing substances such as in physicians nurses, chemists, photographers, cement workers silver smiths, etc These cases are clinically and pathologically indistinguishable from so called eczema In these cases the nail

sions begin as acute paronychia which produce secondary ianges in the nail plates

In chronic eczema of the legs and feet of old people the e nails may become hypertrophied and distorted (ony iogryphosis)

In acute eczema or dermatitis venenata of short duration ie nails are not usually affected but often the presence of eau s lines after the dermatosis has disappeared prove that ie nutrition of the nails was affected to a certain extent



F g 83 Eczema of the foot and toe na ls

In very acute dermatitis or eczema there is a discharging paronychia with great edema and inflammation and the nails may become detached and fall off in a short time but a new normal nail grows after the inflammatory phenomena have disappeared

Dermatitis of the nail bed onycholisis discoloration of the nail plate and keratosis sub unguahs caused by so-called

have stopped marketing these products Winston and Sutton (331) have also reported cases of this nature.

Pathologically the lesions of the nails are due to the primary inflammation of the surrounding skin and of the nail bed and to the secondary invasion by staphylococci

The most important disease to differentiate is onychomycosis, especially in chronic cases The clinical resemblance may be very close and the correct diagnosis must be made by microsocopic examination of the filings of the nail substance Paronychia due to monilia and yeasts may produce eczematoid lesions and the same is true in dermatophytosis of the hands and feet, affecting the vicinity of the nails. In dermatophytids of the hands due to the presence of foci of fungous infection in the feet, the lesions may be difficult to diagnose unless one thinks of looking for the fungi in the toe nails as in these dermatophytids the fungi are rarely found

The treatment of eczema of the nails is the same as that of the variety of eczema or dermatitis in question In acute cases, soothing lotions and slightly antiseptic preparations are indicated Roentgen ray therapy in fractional unfiltered doses is of unquestionable value in chronic cases Strong reducing agents such as tar and pyrogallic acid in ointment form may be necessary In hyperkeratotic cases these applications should contain salicylic acid

Systemic corticoesteroid therapy (cortisone, hydrocortisone *prednisone, prednisolone and corticotropin) is so rapidly* effective in its antieczematous action, that as a rule, it is widely used by dermatologists for acute eczematous dermatitis The inflammatory paronychia which precedes nail dystrophies in some of these cases, is also satisfactorily influenced by these hormones The addition of antibiotics internally will barren infection in many cases

Local application of antibiotics-corticoesteroid ointments may show beneficial results in chronic cases

The removal of the irritating substance in cases of dermatitis of external origin, is of course, of the greatest importance

LICHEN PLANUS

Lichen planus of the nails is rare In certain very extensive cases and in chronic lichen planus of the extremities the nails may present papular paronychia, dystrophies similar to those found in chronic eczema transverse lines and more often longitudinal striations (onychorrhexis) Several finger or toe nails may be affected but rarely all nails Lichen planus papules may be observed on the nail wall overlapping the root, causing a dry, squamous paronychia

Graham Little (102) mentions a case of lichen planus in which the nails presented punctiform depressions like those of psoriasis and also longitudinal striae This combination has also been described in lichen planus by Dubreuilh and Gaucher



Fig 86 Lichen planus Notice onychorrhexis of the fourth and fifth nails and the wasting of the nails (usure des ongles) due to constant scratching

H J Parkhurst (103) has reported a case of lichen planus with paronychia in which all finger nails were affected with transverse linear depressions, longitudinal striations and dryness Later the toe nails also presented transverse lines

Frank Vero (104) has also reported onychorrhexis of all finger nails in a case of lichen planus

Ayres, Jr, (291) has reported a case of lichen planus of fourteen years duration with lesions of the finger nails consisting of longitudinal ridges in the middle of the nails, somewhat reddened and soft They appeared to be continuous with the skin of the nail wall

Gardner and Johnson (437) report onychoatrophy of all the finger and toe nails following lichen planus of the palms of the hands and soles of the feet, with small lesions of the dorsum of the tongue and buccal mucosa The authors have observed isolated papular lichen planus of the nail wall in the right index finger With the administration of x ray therapy the lesions healed leaving a thin atrophic longitudinally split finger nail Several months later papules of lichen *planus developed over the glans penis*

In a personal case of very extensive lichen planus following the use of bismuth for the treatment of syphilis, the patient presented onychorrhexis of the last two fingers of each hand

DERMATITIS EXFOLIATIVA

In this disease the hands are affected early and the nail lesions are frequent The nails are usually thickened, and show different deformities due to the inflammatory process which affects the fingers

The nails lose their color, present sub ungual hyperkeratosis and become partially detached At times in chronic cases onychauxis may be the result of the long inflammatory process or the nails may fall off one or more times

(onychomadesis) The peri ungual grooves are red and scaly Beau s lines are very frequent and usure des ongles may be seen due to constant scratching

According to Ormsby (50) in dermatitis exfoliativa of the Wilson Brocq type the nails become opaque and dystrophic and there is usually thickening of the nail bed which pushes the nail upward with resulting deformity The nails may be shed In the Hebra type (pityriasis rubra) the hair and



Fig 87 Dermatitis exfoliativa The nails were finally shed

the nails lose their luster and become friable and the hair often falls, though the nails may escape

In Erythroderma Desquamativa or Universal Dermatitis of Children at the Breast, described by Leiner in 1908 the nails may be dystrophic and the nail bed may be hyperkeratotic (Ormsby)

PITYRIASIS RUBRA PILARIS

The earliest lesions of this disease are often seen in the fingers and the nails are usually affected The nails are thick, sometimes as much as three or four times their normal size (onychauxis), they are scaly, with sub ungual keratosis, gray in color and may show longitudinal striations and partial destruction of the free edge Nail loss may be observed occasionally

According to Ormsby (50) the nails are gray, yellowish, striated and thickened

Harris and Cleveland (438) have observed onychorrhexis in cases of Keratosis Follicularis markedly improved with the administration of high doses of Vitamin A

ICHTHYOSIS

In ichthyosis the nails are almost constantly *affected* to a greater or less degree The nail changes consist of diverse deformities decoloration, onychauxis and onychogryphosis The peri ungual tissues are scaly and the nails appear prominent and separated from the surrounding tissues but seldom fall off Hyperkeratosis sub ungualis is frequent In ichthyosis hystrix the deformities of the nails may be colossal in size and appear black distorted and ostraceous

ALOPECIA AREATA

In extensive cases of alopecia areata the nails may suffer an arrest of growth with the resulting formation of one or more Beau's lines affecting all the nails Some authors have

described thinning and brittleness of the finger and toe nails

In alopecia areata universalis the nails may fall off by a process of onychomadesis, but usually they are rapidly re placed This is a rare occurrence The cause of this loss of the nails is undoubtedly the same as that which acts on the pilo-sebaceous system, most likely a transitory acute process of the nervous system

Sabouraud (105) does not cite loss of the nails among the manifestations of alopecia areata and states that the nail lesions in these cases are banal and not at all characteristic He has reported leukonychia as a manifestation of alopecia areata, but leukonychia is of such common occurrence that it has no real significance when found in cases of alopecia areata or in any other skin disease In a later contribution Sabouraud (195) states that lesions of the nails are common in severe cases of alopecia areata these nail lesions being of bad prognosis as to the ultimate regrowth of the hair According to Sabouraud the nails may be striated, but the most characteristic lesion is the pitted surface These pits are larger and less deep than those seen in psoriasis and some times only visible when the nail is viewed laterally

Klingmuller and Reeh (439) report that increased familial incidence is observed not only in alopecia areata but also in the occurrence of alopecia areata with pitting of the nails as was seen by the authors in a family in which pitting of the nails was present in the mother, a son aged six, a daughter aged eight and her two eldest brothers, of which, the son and two brothers had also alopecia areata

Investigations in school children revealed that thirty six of 533 with skin diseases, (6 5 per cent) and forty-one of sixty two patients with alopecia areata (66 0 per cent) showed pitting of the nails These observations led the investigators to believe that alopecia areata with pitting of the nails is a real syndrome of pathogenically uniform disease

Bloom (333) reports a case of onychomadesis in a man aged forty-two suffering from alopecia areata of the chin and scalp. All finger nails except one and all toe nails were missing. The nails began to fall 3 years before, shortly after the patient entered military service. Onycholysis has also been reported in some cases.

Corticoesteroids in alopecia areata have been widely used by dermatologists with encouraging results early in the treatment, only to realize, that these promises are short lived; a new wave of alopecia ensuing as soon as therapy is discontinued. Dillaha and Rothman (440) claim good response to severe atrophic nail changes with the administration of corticoesteroid hormones in a patient with alopecia areata universalis. Weiner (441) has obtained negative results with cortocoesteroid treatment in an eleven year old negro girl with nail involvement and alopecia areata. Leider (442) in a forty-one year old white man with alopecia universalis attributes koilonychia and erythema covering the lunula of the finger nails to the corticoesteroid administration

ACANTHOSIS NIGRICANS

Dystrophies of the nails are sometimes found in cases of acanthosis nigricans. Heller asserts nevertheless, that the nail lesions are not important signs of this disease. The nails may show onychauxis or may present thinning, brittleness and atrophy. Nail loss has been reported.

In one of the cases observed by us the nails were represented by strips of distorted nail tissue, there was no free edge and the nails were heaped up toward the center of the nail bed.

At times the last phalanges become hypertrophied and resemble hippocratic fingers to a certain extent.

Darier (106) states that the nails in this disease are brittle.

DARIER S DISEASE

In this rare disease there may be lesions of the nails when the eruption is abundant on the extremities

The ungual manifestations consist of hyperkeratotic lesions situated in the peri ungual grooves, of dystrophic changes such as onychauxis, onychorrhexis, gryphosis and inflammatory paronychia Secondary infection of the con fluent papules is a common phenomenon

According to Darier (106) the nails are striated and brittle Pachyonychia has been considered by some investigators as a manifestation of this disease (182)

RADIODERMATITIS

In radium therapeutists as in roentgenologists and in patients whose fingers have been treated by radium or roentgen rays the nails and peri ungual tissues may de velop changes which are rather characteristic These are usually of dystrophic character due to atrophy of the matrix which is highly radiosensitive Thinning and friability of the nail (hapalonychia) onychorrhexis and nail atrophy with discoloration are the most marked features In some cases atrophy of the nail wall and of the skin surrounding the nail is rather a prominent sign the skin being thinned, wrinkled and pigmented, with numerous telangiectases

Radiodermatitis of the distal end of a finger, if severe, may result in a defluvium of the nail As a rule the nail will regrow Much more common phenomena are transverse or longitudinal ridging slow growth and brittleness of the nail following severe reactions repeated mild reactions, or long-continued fractional exposures without reaction (Mac Kee)

In a case of onychomycosis of the fingers which had been subjected to multiple roentgen ray treatments, the peri ungual tissues were atrophic with points of hyperkeratosis

which threatened epithelial degeneration The distortion of the nails, we believe, was due more to the short wave irradiations than to the fungous infection

In a physician who had used radium and roentgen rays for over twenty years, the tips of the fingers showed hyper keratosis punctata which occupied in part the space between the nail and the finger tip of the index and thumb of the right hand One of these lesions finally suffered epithelial malignant degeneration, the nail was raised and the finger had to be amputated

The most dreaded result of radiodermatitis is the development of epithelioma

Currant Pope (107) advises a palliative treatment for roentgen ray nails which we have found useful in this and several other dystrophies of the nails, where dryness and scaling are prominent features The nails should be bathed in hot water, thoroughly scrubbed with soap and cleansed of all dirt and débris, followed by massage with good olive oil After several days the nails may be carefully manicured and a good liquid polish applied This offers the advantage of sealing the cracks, protecting the nails against dirt and moisture No cuticle remover, orange stick or any other substance should be used in the process of manicuring

KERATODERMA PALMARE ET PLANTARE

The majority of these cases do not present ungual disturbances since the hyperkeratosis stops short of the dorsum of the fingers and toes However passive congestion of the nails, onychauxis, onychogryphosis, and hyperkeratosis subungualis have been reported

We have seen a case of long standing with the formation of a large gryphotic toe nail resembling a horn

In some cases the curvature of the nail increases and the nail appears bent down over the tip of the finger or toe

Portand and Haber (443) have administered aqueous solution of vitamin A in high doses with good therapeutic response in keratoderma palmare et plantare

Cases of keratoderma blenorrhagicum may present hyper keratosis sub ungualis and also chronic paronychia

PEMPHIGUS AND DERMATITIS HERPETIFORMIS

In pemphigus lesions of the nails are not common but the formation of bullae about the fingers and toes may produce dystrophic changes One or a few nails may be discolored irregular pitted or sulcated transversely and in some cases nail loss by a process of paronychia or onycho madesis has been reported These changes are due to the neighboring inflammation and edema interfering with the normal nutrition of the nail and the proper function of the matrix

Costa (444) studied the nails in twenty six patients with pemphigus foliaceous In these cases the nails are involved partially or totally always in intimate relation with the in tensity of the cutaneous manifestations of the disease The ungual manifestation varies from onychoschizia (lamina tion of the nails into two or more superimposed layers) to onychomadesis (separation of the nail plate from its bed beginning at the proximal end) In some cases Beau s lines were so prominent as to simulate waves over the nail plate in two cases pterigium and in one case onychia punctata clinically identical with the onychia punctata of psoriasis Yellowish or dark pigmentations with subungual hyper keratosis and onycholisis was also a frequent observation Infectious paronychia was not observed in this group of patients In pemphigus foliaceous the diseased nails seem to grow faster

Similar lesions may be observed in dermatitis herpeti formis but they are rare

White (11) in his study of 485 cases of nail affections included four cases of dermatitis herpetiformis with ungual lesions, consisting of onychia punctata, transverse lines, super ficial exfoliation and opacity of the ungual plate

According to Heller in some extensive cases of dermatitis herpetiformis the nails may become deformed with corneous accumulations under the plate, resembling chronic eczema of the nails

In acute pemphigus Heller has seen the formation of sub ungual hemorrhages which are due to bloody sub ungual bullae



Fig 88 Dystrophies of the nails in pemphigus foliaceous (Courtesy of Dr Osvaldo G Costa)

In chronic pemphigus with repeated ungual and peri ungual lesions the nails may become atrophied

EPIDERMOLYSIS BULLOSA

In this disease the lesions of the nails are almost constant and constitute one of the most characteristic signs of the condition These changes are explained by the repeated occurrence of vesicles and bullae on the extremities of the fingers and toes as a result of friction and pressure

After several months or years the nails become atrophic losing first the free edge and frequently falling off until the successive nails become smaller and smaller and finally dis appear In these cases the extremities of the fingers and toes become rounded clubbed bulbous like stumps In many cases there is even no trace of the nail plate which becomes re placed by a smooth scar often studded with white cysts of milia

In less advanced cases the nails are represented by small atrophic pieces 2 or 3 millimeters in diameter encased in the dorsum of the phalanx and surrounded by smooth glistening atrophic skin

The lesions affect a number of fingers and toes and some times all of them

Besnier and Wallace Beatty (quoted by Heller) have re ported onychogryphosis in cases of epidermolysis bullosa This must be a very rare occurrence

DERMATITIS REPENS

Dermatitis repens or dermatitis continuee suppurative of Hallopeau affects the extremities but it is more frequent on the hands

In mild cases it consists of a flaccid bulla which spreads peripherally undermining the corneous layer of the skin and separating it from the subjacent epithelial layers It is

an infectious condition probably due to a streptococcus In the most pronounced cases the lesions are numerous and pustular, the inflammation is more marked and constant and the condition proves very resistant to treatment.

The lesions affect the peri ungual tissues very frequently, the nail plate becoming partially detached from the lateral grooves and a watery secretion oozes from the nail bed One or more fingers may be affected These lesions form an inflammatory paronychia A pyogenic granuloma often develops and the nail is shed



Fig 89 Epidermolysis bullosa Extreme atrophy of the nails with clubbed toes

In chronic cases affecting both hands or both feet we have seen the repeated formation of bullae and pustules around the nail, in the form of a chronic purulent paronychia with loss of the nail and ultimate atrophy In the average case, close trimming of the corneous epidermis around the edges of the bulla, application of 5 per cent silver nitrate and a

dressing of sulfa powder twice a week has proved to be a very effective treatment Daily painting of the lesions with a 5 per cent aqueous solution of gentian violet is also very effective In chronic cases with great inflammation and recurrent pustular formation, all therapeutic measures fail in many cases Autogenous vaccine and ultraviolet light may also help in some cases

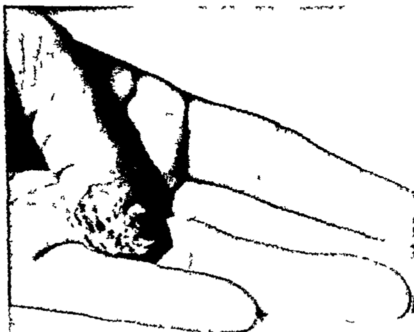


Fig 90 Dermatitis repens Notice small granuloma pyogenicum in the lateral groove

Antibiotics internally or in local application have proved ineffective in most of our cases

SCLERODERMA

In diffuse scleroderma dystrophic disturbances of the nails may be observed, particularly atrophy and onychorrhexis

In sclerodactylia the nails are usually atrophic, bent over the finger tips, shiny and with transverse lines In some cases ulceration of the tip of the finger may lead to infection and loss of the nail One or more fingers may be affected but rarely all of them The lesions are usually found on the fingers, rarely on the toes

Onychogryphosis has been reported in some rare cases

Of 480 cases of scleroderma, Heller reports nail lesions in fifty two or in nearly 11 per cent Vesicles may occasionally



Fig 91 Atrophy of the nails in sclerodactylia

be seen in the peri ungual tissues Loss of nails and gangrene of the fingers have also been observed

Calcium metabolism has been found increased in some of these cases Steroid therapy is now the treatment of choice

POIKILODERMA ATROPHICANS VASCULARE

This disease, first described by Jacobi (108) and later by Petges and Zinsser (109) in Europe has been particularly well studied in America by John E Lane The nails are very often affected, dystrophic, with diverse deformities and onychauxis

Zinsser has seen atrophy of the nails which were reduced to the state of horny flakes Jacobi has also reported extreme atrophy of the nails and the presence of telangiectasia of the peri ungual tissues

KYRLE S DISEASE
(Hyperkeratosis Follicularis et Parafollicularis in Cutem Penetrans)

In a case of this rare condition reported by Bruno Bloch (173) the nails were huge, crooked, transformed into cone shaped stalagmites The nail most severely affected was that of the thumb of the right hand which was crooked, about 3 cm long and arched, about 1 cm in diameter, set on the nail bed at an angle of about 30 degrees The nail wall and the skin of the whole extremity of the finger was inflamed, red and infiltrated

POROKERATOSIS

A case of Mibelli s porokeratosis associated with cutaneous horn dystrophy of the nails and atrophy of the interosseus muscles has been reported by Franks and Davis (292) The patient was a man aged twenty one who had the hyper keratotic lesions on the right hand since childhood the nails

of the ring and little fingers were striated longitudinally and were atrophic and soft with pigmentation of the free edges The proximal ends of the nails were covered with soft tissue

ELEPHANTIASIS

In elephantiasis of the legs the toes are not usually enlarged but on the contrary are atrophied and appear as ridiculously small appendages at the end of the enormously hypertrophic leg

Sometimes the toes are covered with hypertrophic corneous vegetations and the nails become atrophic with a raised free border small remnants of the ungual plates being vertically or obliquely implanted on the nail bed The nails are black or gray and surrounded by hyperkeratotic skin

More rarely there may be onychogryphosis

SYPHILIS

Syphilis may affect the nail plate the nail bed and the peri ungual tissues

According to Fournier (110) (111) syphilitic onychia may assume four types

1 Fragility and fracture of the nails (onychia craquelé)
2 *Partial loosening of the nail*
3 Total loosening and fall of the nail
4 Hypertrophic onychia

Beside these clinical forms described by Fournier several authors have reported cases of koilonychia onychogryphosis and the so-called scabrities unguium syphilitica which consists of complete crumbling of the nail plates with the formation of stratified adherent layers All these types of syphilitic onychia are found in the late stages of the disease

We have seen several cases of a condition of the nails of all fingers in women suffering from secondary syphilis This

is a superficial onychia in the form of arabesques of ripples and waves affecting the outer surface of the nail plates from the lunula to the free border For this type we propose the name of onychia superficialis undulata These nails are not at all distorted but appear rather elegantly marked as if a drawing had been attempted on a soft waxy surface These cases occurred in young white women suffering from rather profuse secondary syphilids Milian (112) has reported a similar case in a patient with tertiary syphilis of seven years duration Undoubtedly this condition must be due to disturbances of capillary circulation and irregularities of cell production in the matrix

Syphilitic onychia punctata has been reported by Spitzer (168) in fourteen cases The syphilitic erosions in his cases



Fig 9? Syphilitic chancre ulcerating type with destruction of the nail plate

were smaller in number and greater in size and depth, than similar lesions seen in other types of onychii Often the markings were elongated and of longitudinal distribution No other cutaneous lesions were observed The situation distribution and order of appearance of these lesions indicate that they arise from the nail bed, which, Spitzer asserts, is a favorite location of the spirochaeta pallida These lesions are of great diagnostic value and are commonly found in cases of congenital syphilis or in the late stages of the acquired form of the disease They are very resistant to treatment

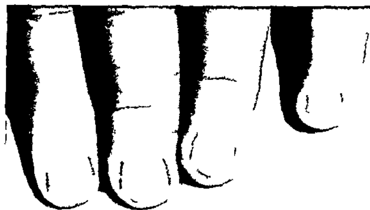


Fig 93 Onychia superficialis undulata in secondary syphilis

Fragility and fracture of the nails (onychia craquelé) is according to Fournier more frequently observed in women The free edge of the nails appears fissured cracked and breaks off on slight pressure If the nail is trimmed the fractures in small pieces continue to be produced there may be some desquamation and exfoliation and the free edge often presents a serrated appearance Cormia (224) reports an ir

teresting case of this type in which the only apparent symptoms were those of the nails Specific treatment caused quick regression of the lesions Longitudinal fissures may affect the whole nail plate in variable number (onychorrhexis) The finger nails are usually affected, the toe nails rarely This is a late manifestation of syphilis and it is often the only lesion of syphilis present Its diagnostic importance therefore may be considerable The presence of such onychia may set the physician on the road to the right diagnosis in otherwise obscure cases

Partial loosening of the nail is a form of onycholysis The nail becomes raised and separated from its bed turning



Fig 94 Solitary sub-ungual and peri ungual syphilitic papule

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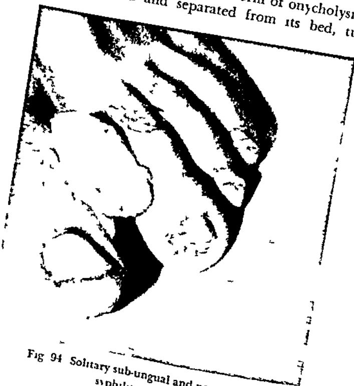


Fig 94 Solitary sub-ungual and peri ungual syphilitic papule

yellowish or grayish in its anterior portion Occasionally however the affection progresses to the root and the nail falls off, leaving the dry and desquamating bed exposed This process is always dry and painless At times the ungual plate becomes rolled upon itself from side to side affecting the shape of a Spanish roof tile *Exceptionally the loosening* of the nail may begin at the root and progress forward (onychomadesis) in which case the nail is always inevitably lost This is also a late lesion, affecting the fingers as well as the toe nails As a rule several nails are affected simultaneously or successively and at times all nails may be attacked by this process

According to Farré and Chapuy (167), onychomadesis, particularly of the big toes is due to syphilis in many cases This phenomenon is common in tabes In cases of repeated loss of toe nails, syphilis should be investigated and specific treatment instituted

Hypertrophic onychia (onychauxis) is a rare form of syphilis of the nails The ungual plate becomes thickened two or three times its normal size, appears irregular, fractured and dissociated in stratifications In other cases the nails may be very dense, horny and grayish in color It is a late manifestation and as a rule only one or a few nails are affected

Milian (113) has described a nail sign which he believes almost pathognomonic in cases of late syphilis It consists of the presence in the nails of some fingers (middle and ring) of an arch 0 5 to 1 millimeter broad, lilac colored about four to five millimeters behind the free border and parallel with it Milian states that this sign is a living witness of active syphilis, congenital or acquired We have observed this sign in a number of cases of late asymptomatic syphilis and in two patients all finger nails were affected The color of the strip is dark violaceous and forms a well defined

crescent behind the free border of the nail It does not grow with the nail, but remains in a fixed position and disappears under treatment

In many of these cases the lunulae are diffuse, lacking their well marked limits Nevertheless, this sign is not exclusively seen in syphilitics, but also in cases of leprosy, chronic arthritis and during the convalescence from febrile diseases, in which there has been much wasting and the patient has become very weak and thin Pitting of the nails in old syphilitics has also been reported by Milian (145) Milian (225) insists on the frequency of these small, rather elongated erosions of the nail plates in the absence of other manifestations of syphilis and, consequently, on their diagnostic value

All these lesions are frequently solitary manifestations of syphilis and therefore of great diagnostic importance in cases which are otherwise apparently asymptomatic The diagnosis should always remain sub-judice until the nature of such lesions has been proved beyond doubt by serologic or other clinical evidence of syphilis The effect of specific treatment on the future development of the nails confirms the syphilitic nature of the process, but due to the slow growth of nails this proof cannot be obtained until several weeks after the treatment At times the syphilitic nature of these chronic onychias cannot be ascertained, for the matrix may have been affected beyond repair and in this case the nail plate will continue to grow abnormally

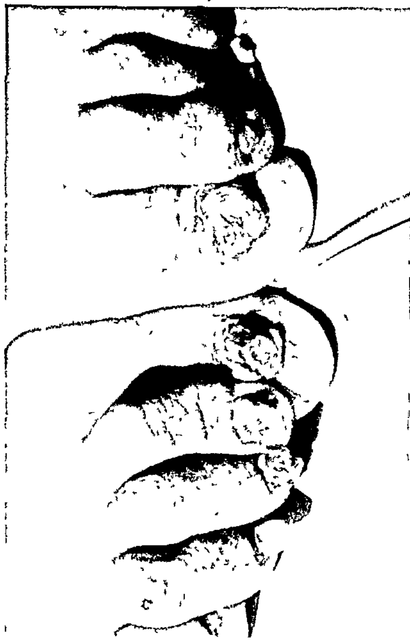
During the early periods of the disease we have seen koilonychia in the thumb nail in one case According to some observers koilonychia should be always regarded suspiciously as of syphilitic origin Howard Fox (73) has reported a case of koilonychia in three fingers of each hand in a syphilitic man aged twenty six



Fig 95 Scabrities unguium syphilitica The nails grew normally after specific therapy

The differential diagnosis of syphilis of the nail plate may be very difficult at times Thus William H Guy (25) in discussing a case of ringworm of the nails reported by Phillips stated that in spite of the finding of fungi the possibility of syphilis of the nails should be considered and cited a case which cleared up only when specific treatment was instituted Naturally in a number of cases the nails affected by syphilis may easily be infected with fungi

In a personal case of chronic destructive onychia in which the diagnosis of onychomycosis was confirmed by direct



microscopic examination and by culture, the condition affec ting all finger nails proved intractable until the discover of a positive blood test for syphilis The nails healed rapidl under antisyphilitic treatment, but remained distorted anc atrophic

In early syphilis the finding of treponema pallidum in the lymph of the posterior nail wall is not difficult This seem to be a choice location for the treponema pallidum, possibly due to the slowness of the circulation

Peri ungual Lesions The peri ungual lesions of syphilis are more frequently observed than the onychia just described

In the first place a chancre may appear in the peri ungual tissues and this location is relatively frequent among the *extragenital lesions (5 per cent) It is more common in* physicians, nurses and midwives and occurs on the index finger, for obvious reasons It may be ulcerative, hyper trophic and erosive

The ulcerative form is a more or less deep ulcer situated along one of the lateral borders, encroaching upon the nail bed, raising and destroying the nail

The hypertrophic form is a raised framboesiform mass, looking like a large granuloma pyogenicum but firmer and with an infiltrated base and serosanguinolent discharge

The erosive form may be a very innocent looking lesion surrounding the posterior nail wall or even the whole nail in a crescentic form (chancre semi lunaire de Fournier), (114) It is fleshy and reddish in color it oozes a scant amount of serum and appears as an erosion due to the absence of the corneous layer following trauma Its regularity and well de fined margins should be noted

Another type of chancre may be rather inflammatory and infiltrated and resemble a panaritium particularly because this infiltrating lesion is very painful and because it may show *secondary infection with the production* of a purulent discharge

In all these cases spirochaeta pallida may be difficult to demonstrate due to the secondary pyogenic infection, but as a rule chancres about the nails are found *teeming* with the organisms

An important diagnostic point is the presence of painless, non inflammatory enlargement of the epitrochlear or axillary glands

Every peri ungual ulceration or infiltration with more or less inflammation, even if very painful, should be regarded as suspicious unless there is a frank collection of pus and spirochaeta pallida is absent Induration is not a sign of value in this location, due to the firmness of the tissues about the nails

Accidental vaccinations of peri ungual location have been reported by Curth and Garb (332) resembling syphilitic chancre

When a syphilitic chancre heals, it usually leaves a permanent scar and the ungual plate remains distorted, irregular and bound to the bed or to the skin of the nail walls

During the early manifestations of syphilis, particularly when well advanced and neglected, (after the second month in untreated patients) or in relapsing cases, paronychia of the following types may be observed

1 Peri ungual or sub ungual papules
2 Confluent peri ungual papules
3 Papulo squamous paronychia
4 Ulcerative paronychia

Peri ungual papules may be present in the lateral grooves of the finger or toe nails, in the nail wall at the root or even under the nail encroaching on the nail bed These papules, which are of dull red color and are deeply situated, usually have a certain amount of desquamation like that of palmar and plantar lesions The desquamation often takes the form of a corona surrounding the papule The lesions are

usually dry and slow in their evolution They often affect the nail plate, raising it from its bed, cracking it in part or producing various deformities, particularly when the papules affect the root of the nail, and therefore interfere with the normal function of the matrix

The peri ungual papules may become inflammed, raw and oozing, may coalesce, become painful and constitute a con dylomatous mass These lesions are very foul

In these cases one or more nails may be affected, rarely all of them and the toes more often than the fingers

In some cases the lesions may be keratotic (syphilitic callus of Fournier)

Papulo-squamous syphilids about the nails may affect the dorsum of the phalanx and even several fingers, acquiring *a psoriasiform aspect The nail plates often present Beau's* lines and other deformities

Paronychia ulcerosa is most common in the toes, particu larly in the great toes It is a lesion of the late secondary period and often a type of relapsing syphilid We have seen many cases where this paronychia ulcerosa was the only apparent symptom of cutaneous syphilis, or at the most was accompanied by interdigital macerated papules of erosive character *These lesions are extremely painful usually* secondarily infected and secrete abundant foul purulent dis charge

Paronychia ulcerosa begins in the lateral wall or the lateral groove of the nail, surrounding sometimes the whole nail in the form of an inflammatory, red, irregular ulcer which soon becomes very deep, loosening the nail from its bed The ulcer increases slowly in size and in depth, its edges become necrotic and of dark violaceous color In many cases the size of the toe or finger increases two or even three fold, and the patient suffers day and night from intolerable boring pain This type of onychia and paronychia has been

described under the name of onychia syphilitica maligna

The old conception of a peculiar independent onychia maligna has been abandoned and as shown by Pollitzer (115) this condition is due to a definite etiologic agent

Persistent paronychia syphilitica inspite of chemotherapeutic measures was cured by fever therapy (hypertherm) as reported by Howard Fox (293) Penicillin is the treatment of choice at present for such cases

The late manifestation of peri ungual syphilis is the gumma which is rare in this location It usually affects the end of the finger and destroys the nail plate and the peri ungual tissues Sometimes the gumma affects the bone primarily and the peri ungual and ungual tissues secondarily As a rule the tip of the finger is eliminated with the necrotic material and the nail disappears entirely or becomes atrophic

In congenital syphilis lesions of the nails are not rare when the child is born with active manifestations The most frequent lesion is a multiple inflammatory paronychia with loss of several nails of the fingers and toes or of both This is an acute inflammatory reaction red erosive and with abundant serous discharge which ends by loosening the nail plate In favorable cases these lesions disappear entirely under specific treatment and the nail may grow again normally Onychia sicca with atrophy of the nails syphilonychia ulcerosa and congenital anonychia due to syphilis have been reported by Heller

Ravaut and Monnerot Dumaine (116) have reported a case of atrophy of the nails with striations and disintegration of the ungual plate in a girl aged fifteen suffering from congenital syphilis In some of the nails there were synechiae holding the remnants of nail tissue to the peri ungual skin These lesions had been present for nine years and several fingers and toes were affected Milian (226) stated that

Thibierge was the first to call attention to the arrest of growth of the nails in cases of syphilis, under the name of "ungual sideration," *in the fingers as well as in the toes* In the majority of cases the patients have been congenital syphilitics Milian reports the case of a young man of seventeen years in whom the nails had ceased to grow, the nails had the appearance of being filed off, were about two and one-half millimeters in length and encased in the skin of the tip of the fingers The patient had never needed to trim or *file his nails Specific treatment resulted in a normal growth* of all the nails

Another dystrophy attributed to congenital syphilis is that reported by Du Bois (169) under the name of 'nail en raquette ' In these cases the nail, usually that of the thumb, appears wider than normal, its transverse curvature diminished, so that the nail seems flat The effect is that of a miniature tennis racket

Ronchese (421) after investigating the racket thumb nail in a group of sixty three cases, concludes that because of the



Fig 97 Paronychia syphilitica ulcerosa in early syphilis

high percentage incidence in various members of the patients family it is reasonable to call this a hereditary phenomenon In only one case congenital syphilis was proved The condition may be bilateral or unilateral When unilateral it is seen more often on the left than on the right thumb Its predominance in the female is remarkable and so conspicuous that young girls hide their thumbs in shame The author has not seen this nail anomaly on the toe nails



Fig 98 Paronychia syphilitica of the ulcerative type affecting all finger nails in a case of advanced early syphilis The toe nails were similarly affected specific treatment effected a complete return to normal

Congenital pachyonychia of which we shall speak later under the congenital lesions of the nails has been attributed to syphilis Milian (?27) has reported a case of pachyonychia in a boy aged six in which specific treatment effected a complete recovery



Fig 99 Chronic hypertrophic onychia and squamous paronychia in a case of Pinta (Courtesy Dr Osvaldo G Costa)

YAWS

Onychia, paronychia, atrophy of the nails and several deformities may be observed in patients with late yaws These lesions are similar to those observed in late syphilis Manson (294) mentions such nail changes

ridge on a dry discolored nail The free edge presents an indentation which corresponds to the end of this ridge For this dystrophy we propose the name of gable nail' of leprosy

In cases of lepromatous leprosy and in mutilating lesions, there may be peri ungual nodules vesicles and the so called analgesic panaritium or Morvan s disease In these cases there is always pyogenic infection, loosening and destroying the nail without the least pain These lesions are usually seen on the fingers and rarely on the toes One or two nails are affected at the same time but gradually and successively all fingers may be affected

In Morvan s disease the swelling and inflammation may be enormous and the bone is eliminated if amputation is not performed in time



Fig 100 Onychia and paronychia ulcerosa in a case of leprosy

In all these cases the nails are usually lost permanently but regrowth occurs at times the nails being then irregular twisted blackish small affecting the form of filiform or punctiform appendages which are raised or bent

In ulcerative cases there may be a paronychia affecting several finger or toes with oozing of serum or bloody pus These ulcers may become very deep and reach the joint resulting in the complete loss of the last phalanx This process is characteristically painless

In reality lesions of the nails in leprosy are most varied and all types of dystrophies may be encountered onychauxis atrophy hapalonychia onychorrhexis onycholysis etc

In *syringomyelia* similar lesions may be found due to the muscular atrophies and the anesthesia of the extremities which give rise to similar disturbances as in leprosy

Volavsek (295) reported among the early changes in two cases of syringomyelia palmar keratoses and dystrophic changes in the finger nails with enlargement of the terminal phalanges simulating drum stick fingers



Fig 101 Lupus vulgaris in a post mortem room attendant

LUPUS ERYTHEMATOSUS

In lupus erythematosus disseminatus nail lesions ending in onycholysis have been described but they are rare

McCarthy (117) has reported a case of lupus erythematosus *of the dorsum of the hands with paronychia* and onychia ending in complete destruction of the nails Notable improvement followed the use of gold therapy

Under the name of lupus erythematosus unguium mutilans Heller has reported a case affecting the dorsum of both hands in which the nails had become reduced to irregular *discolored worm eaten strips adherent to the ungual* bed with deformities of the ends of the fingers

Dark erythema around the nail wall with pigmentation *may be observed in extensive cases of lupus erythematosus* exanthematicus often the peri ungual lesions are prominent Rothman (296) has reported similar changes In lupus erythematosus exanthematicus vibices and petechia are often early signs in the nails of the hands

TUBERCULOSIS OF THE SKIN

Of all the tuberculous manifestations of the skin verruca necrogenica is the one most frequently observed about the nails This affects one of the lateral nail walls or grooves or the end of the finger under the nail The nail plate may become distorted or may be shed We have seen two cases of verruca necrogenica in physicians affecting the index finger in both cases In one of the cases the patient was injured during a post mortem examination and in the other case contamination was probably due to repeated examinations in a case of tuberculosis of the larynx The lesions were small verrucous grayish nodules situated in one of the lateral grooves Electrocoagulation resulted in permanent cure in *both patients*

We have seen a case of lupus vulgaris in a post mortem room attendant which affected the last phalanx of the little finger of the right hand advancing to the nail groove The lesion was about two centimeters in diameter on the outer side of the nail increasing the volume of the finger but not affecting the nail plate Five yellowish nodules were visible under diascopic pressure showing the typical apple jelly color Histopathologic examination proved the correctness of the diagnosis Electrocoagulation of the entire lesion resulted in complete and permanent healing although the nail remained deformed

Acute paronychia lymphangitis and tuberculous adenitis have been reported as a result of inoculation with tubercle bacillus in the nail tissues Stokes (7) has reported a case of tuberculous paronychia in a young woman of twenty five which was previously mentioned in the paragraph on paronychia in general

Some cases of ulcerating paronychia have been attributed to tuberculosis and the so called onychia maligna may be due to infection with the Koch bacillus If these cases exist they are indeed very rare

INFECTIOUS DISEASES

In pulmonary tuberculosis hippocratic nails are very frequent affecting all fingers and toes This is one of the best known types of ungual dystrophy

According to Hahn (118) 100 per cent of cases of active tuberculosis present disturbances of the nails In inactive cases the proportion is only 6 per cent He considers pitting of the nails to be characteristic of recent active tuberculosis Hippocratic nails according to Hahn are found in 76 per cent of cases of active tuberculosis and in 50 per cent of inactive tuberculosis Cyanosis of the finger nails was found in 66 per cent of his active cases and in only 2 per cent of

his inactive cases According to Hahn, cyanosis of the nails is a sign of rapidly advancing tuberculosis

Personally we believe that while cyanosis of the nails and hippocratic nails are rather common in tuberculosis, they are not as frequent as stated by Hahn In the examination of more than sixty cases of active tuberculosis in the dis pensary of the University Hospital in Havana, no case showed hippocratic nails and only a few presented more or less marked cyanosis of the hands It is possible that in colder climates passive congestion of the hands is more common

In typhoid fever, during convalescence, the formation of Beau's lines is frequently observed in several or even in all *fingers and toes One or more lines may be found*



Fig 102 Onychia and paronychia squamosa in a case of post arsphenamin dermatitis

Defluvium of all nails (onychomadesis) has also been c served during convalescence of typhoid fever, at times coin dent with defluvium capillorum The nails and hair a usually replaced in these cases

Mintzer (297) has reported a case of onycholysis a onychogryphosis in a patient suffering from chronic ulce tive colitis the underlying debility being probably respo ible for the lowered resistance of the nails All the nails w affected



Fig 105 Transverse lines after arsphenamin dermatitis

In tularemia the initial lesion may affect the nail t or the nail walls with necrosis and destruction of the r plate Hitch and Smith (228) have published cases of t type

In scarlet fever Beau s lines are frequently observed a recovery Total onychomadesis has been frequently obser during the extensive desquamation typical of this dise At times the skin of the entire hand and the nails have b shed in the form of a glove The loss of nails in these c takes place very rapidly but without any signs of inflam tion and without pain

Beau's lines and loss of one or more nails have been observed after influenza, mumps, diphtheria, erysipelas, puerperal and other fevers The prognosis in these cases is good, as the nails are always replaced normally

Diphtheria of the nails is very rare at present It occurs as a superficial ulceration of the peri ungual tissues with the formation of whitish or grayish membranes and serous exudate While these cases are very rare at present (Rolleston, quoted by Heller) they were observed in the pre antitoxin era when the physician had to dislodge the membranes from the throat with his bare finger, using the nail, and also during intubation.



Fig 104 Onychauxis in a case of infantile paralysis with extreme atrophy of the muscles

In chronic rheumatism the nails become dry, brittle, with hapalonychia, onychorrhexis, sub ungual hyperkeratosis (Israelski, 119) and sometimes onycholysis and loss of nail Onychogryphosis may occur in the toes According to Rosenau (142) onychia punctata or pitting of the nails is a very common phenomenon in acute rheumatism

Argy (176) studied twenty two cases of arthritis, in order to compare the cystine content of the finger nails with the sedimentation rate of the blood He found that these two reactions varied in inverse proportion Such variations could possibly indicate a toxic etiology and that the control of this toxicity might be induced by sulphur therapy Later the use of sulphur therapeutically in certain cases of arthritis with low cystine content of the nails, has proved beneficial However, it has been stated (229) that sulphur therapy has not proved to be better than many other therapeutic procedures, which are usually helpful, although not curative, in arthritis The Council on Pharmacy and Chemistry of the American Medical Association has repeatedly refused to accept 'colloidal sulphur' preparations because of lack of sound evidence of their claimed usefulness

NERVOUS DISEASES

In injury to the nerves (ulnar, median radial) diverse dystrophies of the nails are observed, such as atrophy and onychauxis It is peculiar that in some cases atrophy may be the outstanding feature while in others of the same type of injury, there may be onychauxis and onychogryphosis The reason for this is unknown The same type of lesions may be observed in peripheral neuritis and in fractures of the extremities with muscular inactivity during long periods

In hemiplegia, multiple sclerosis tabes, epilepsy, paresis, hysteria and the several types of psychosis, dystrophies of the nails are common, but have no distinct characteristics The

ungual lesions in these cases are due to nutritional disturbances of the nail matrix occasioned by nervous disorder of trophic nature

Weidman (196) has reported a case of trophic ulcers of the fingers due to cervical ribs The nails were thick, opaque and deformed Trauma on the cervical plexus was responsible for these symptoms and removal of the abnormal ribs was followed by a gradual recovery Cervical rib is a congenital anomaly but symptoms usually do not develop until after the second or third decade The cutaneous changes are caused by pressure on the subclavian vessels or on the brachial plexus In the cases reported by Rubin and Cipollaro (230), (237), there was onycholysis with atrophy of the nail plate and atrophy of the skin of the thumb and middle finger of the left hand, the bones showed moderate absorption of lime salts especially in the terminal tuft of the thumb and the middle finger

In tabes a fall of the nails has been observed with or without preceding sub ungual hemorrhage The nails fall off without inflammatory symptoms and are replaced by new brittle nails, which in turn fall off again (Dieulafoy, 120) Onycholysis is also frequent in tabes

In hysteria we have mentioned nail fall (onychomadesis) and blood effusions of the nail bed

Klauder (298) has reported the case of a Negro who shaved all the nails of the right hand for fear of contracting a disease through them while shaking hands

Andrews (342) reports the case of a mentally deranged woman who scraped her finger and toe nails daily to rid her system of disease

In epilepsy, nail fall has also been recorded, and Beau s lines particularly in the toes may mark the frequency of the attacks Sub ungual hemorrhages have also been observed

In tetany (299) the nails become brittle, ridged and may be shed These changes are believed due to spasm of the blood vessels of the nail bed

Oppenheim (121) has reported several cases of hyper aesthesia unguium or onychalgia nervosa, in which appar ently normal nails were extremely sensitive, so much so that the patients could not perform simple actions such as buttoning their clothes or lacing their shoes Peripheral neuritis was carefully excluded Oppenheim considers this to be a neurosis and reports that all his cases occurred in nervous families in which a history of other nervous dis turbances could be elicited Applications of galvanic current and psychotherapy are useful for this condition In cases of erythromelalgia, clubbing of the fingers and onychauxis have been observed

A case of tropho edema (Milroy s Disease) with onychauxis and onychomadesis has been reported by Klauder (180)

Onychomadesis and onycholysis have also been reported in erythrocyanosis of the hands

Edwards (335) reports pterygium of one or more nails in arterio spastic states of the extremities with return to normal after sympathectomy Thickening, roughening and discolora tion of the nails, diffusion of the lunula, claw nails and onychomadesis also have been observed as a result of organic arterial disease and in ischemic states painful nails (onych algia) may occur In advanced cases the nails may be involved in acral ulceration or may show sub ungual abscesses over an osteomyelitis of the terminal phalanx

GANGRENE OF THE EXTREMITIES

In Raynaud s disease and in Buerger s disease (throm boangiitis obliterans) disturbances of the nails of the affected fingers or toes are very frequent The nails may be cyanotic in the first stages of the disease and pain may be very intense

in one or more of them The great or the little toe seem to be the frequent site of the beginning of the disease As the process advances the cyanosis becomes permanent and the nail may present Beau s lines or become partially loose When gangrene sets in, the affection is often confined in the beginning to a small area about the end of the toe with the formation of bloody bullae, and later spreads to the rest of the toe Raynaud s disease occurs more frequently in the fingers of women and Buerger s disease in the toes of men The nail may become atrophic distorted in various ways and finally destroyed by the gangrenous process



Fig 105 Chronic atrophic onychia and gangrene of the big toe in a case of thromboangiitis obliterans

When the gangrenous area is limited and healing takes place, the nail usually remains distorted or may be completely lost and replaced by scar tissue Black nails due to hemorrhages in the nail bed are occasionally seen

In senile gangrene and diabetic gangrene the nail changes are similar Secondary infection and paronychia pyogenes ulcerosa may take place, a type which has been included among the heterogenous group of paronychia and onychia maligna

ANEMIA

In some types of anemia nail changes have been reported In chlorosis the nails may be thin and brittle and very pale

In achlorhydric anemia, Broeckema (122) has reported two cases of koilonychia the dystrophic changes disappearing after treatment for the anemia

We have seen a case of this type of anemia in which all the finger nails were raised from their beds in the anterior two thirds (onycholysis) and the nail plates were grayish, thinned and longitudinally striated Other observers have also reported koilonychia

Lewis (184) thinks that koilonychia is of great diagnostic significance in microcytic anemia

In Plummer Vinson s syndrome, spoon nails may be a prominent symptom, accompanying dysphagia, hypochromic anemia atrophy of the tongue and cheilitis A case of this type has been reported by Anderson (231) in which the nails of the index and middle fingers were affected Treatment with iron and liver extract caused a disappearance of all symptoms and, six months later the nails were normal

Convex finger nails occurring in patients with nutritional hypochromic anemia and macrocytic anemia have been reported The nails present convex surfaces both longitudinally and transversely resembling the convex aspect of a spoon



Fig 106 Onycholysis and discoloration of the nails in a patient under prolonged strict diet (Avitaminosis?)

and just exactly the opposite of koilonychia They differ from clubbed fingers in that the tips of the fingers and toes are not distended and the phalanges taper normally (300)

Sertoli (361) reports melanonychia (laminar pigmentation) striata longitudinalis of the thumb nails in a thirty eight year old woman with hypochromic anemia

Under the name Sideropenia Waldestrom (301) has reported a syndrome consisting of fissures of the angles of the mouth burning sensation of the tongue, koilonychia and fissuring of the skin of the finger tips The blood count and haemoglobin content may be normal but nevertheless the patients improve and get well under iron therapy Waldestrom believes that in these cases there is a deficiency in iron although anemia does not develop and which may be accompanied by a deficiency in the utilization of certain factors of the B complex

Spies (445) reports brittleness diffuse pigmentation and koilonychia in a woman with iron deficiency, intensive therapy with folic acid and vitamin B_{12} was unsuccessful Only after eight months of treatment with ferrous sulfate her nails became normal

AVITAMINOSIS

White of Chicago (175) has observed cases in which the nails were brittle ridged and furrowed and this has cleared on vitamin therapy although it had resisted other methods of treatment Vitamins B and D were employed in these cases

We have not seen cases of this type but it is an interesting observation to keep in mind in those cases of nail dystrophies in which no apparent etiology can be found

Degos Henault and Laffont (302) report a case with glossitis cheilitis fissures and alterations of the nails and dryness of the skin which they believed due to avitaminosis

C The patient was a woman aged fifty five who had lived on a deficient diet for ten years the changes of the nails consisted of transverse hollowing and raising of the borders Administration of vitamin C caused the condition to improve and finally disappear

Reiss (303) has reported the presence of Beau s lines among the symptoms of avitaminosis A affecting the skin and its appendages



Fig 107 Characteristic early changes due to chronic hypo vitaminosis (B and D) (Courtesy of Dr Cleveland White)

Sertoli (361) reports excellent result with oral administration of high doses of vitamin A in a patient with longitudinal and transversal furrows of the finger nails Previous to treatment capillaroscopic examination revealed stasis which disappeared after treatment

In many cases of pellagra the authors have never seen disturbances of the nails that could be attributed to this disease W C Brownson quoted by Sutton (123) has reported a case of transverse white bands in a case of pellagra This is a rare ocurrence

According to Manson Bahr (294) the hands age out of proportion to the rest of the body and the nails become atrophied and brittle after the disappearance of the eruption in patients with pellagra

CIRRHOSIS OF THE LIVER

Kleeberg (446) has observed in patients with hepatic cirrhosis, flat whitish finger nails (platonychia), in one finger usually the thumb the index and middle finger being next in frequency Terry (447) has found leukonychia totalis and platonychia in 82 of 100 cirrhotic patients examined The affected nails exhibited a ground glass like opacity of almost the entire nail The lunula is indistinguishable and the opacity stops 1 or 2 mm before reaching the distal end of the nail bed, leaving a distal zone of normal pink According to the author white nails are rare in healthy adults and therefore their detection may be of some importance

Morey and Burke (448) describe opacities of the nail beds the margin of which was centrally peaked in patients with cirrhosis of the liver

DYSENDOCRINIAS

In examining 562 patients with endocrine disturbances Heller (124) found only eight cases in which disturbances of the nails could be attributed to the glandular dysfunction He thinks that very few cases of nail affections can be directly attributed to endocrine disease

Undoubtedly there are no specific nail disorders typical of any diseases of the glands of internal secretion, but it cannot be denied that in a considerable number of cases of these conditions the nails may present diverse dystrophies The best known is the brittle thin and striated nail of

hypothyroidism, almost typical in cases of myxedema, co incident with dryness, atrophy and partial loss of hair and with dry, scaly and myxedematous skin

In hyperthyroidism we have seen two cases of atrophy of the toe nails and finger nails, which although of apparent normal thickness and color were of small size and embedded in the ungual bed.



Fig 108 Onychorrhexis and thinning of the nails in a case of myxedema

The value of thyroid administration in some cases has been proved and some cases of onychia and chronic ony chauxis have been apparently cured with thyroid extract, as in the case reported by Alderson (63) which was cited in the paragraph concerning onychauxis in general

According to Pende (150) 'the nails in the various constitutions behave like the hair In hypoplastic constitutions we find fragile thin nails of infantile type, subject to striae and white spots, atrophic and slow of growth, while in hyperthyroids and hyperpituitaries there are well developed, shiny nails, that grow rapidly It is characteristic of the hypopituitary constitution that the lunula of the nail is frequently absent or very small In certain endocrinopathics, notably the hypogenitals, we have seen nails like the crystal of a watch

Wander (76) found in a girl, aged nine, hyperkeratosis of the tips of the fingers and toes, deep fissuration with frequent bleeding and painful keratoses of the palms and soles which produced great difficulty in walking The nails were thickened and looked like pieces of coal so that the ends of the fingers and toes had a charred appearance The hair was dry, scanty and brittle and poor in pigment The teeth were separated and the gums were spongy The mentality and physical development were normal The basal metabolic rate was minus forty seven and prolonged treatment with thyroid extract produced remarkable improvement

Masakazu and Kawabe have reported on fifty cases of keratoderma in young women in which there were thickening of the nails and transverse ridging These authors believe that a thyroid disturbance is the cause of this condition Encouraging results were obtained with small doses of potassium iodide and direct irradiation of the thyroid gland with radium (170)

Hollander (62) has reported a case of dystrophia adiposogenitalis with onychauxis of all finger and toe nails and another case of the same disease (65) in which the nails were thin, friable and had longitudinal striations

Bruno Bloch (66) found thin and atrophic nails in a case of underdevelopment of the sexual glands and in another case of dystrophia adiposo genitalis the nails of the fingers and toes were markedly altered They had disappeared entirely from the index finger of the right hand and the rest of the nails were so stunted that only irregular horny scales remained and these were markedly curved at the free end toward the palmar aspect of the fingers According to Bloch the conclusion that may be drawn from the study of these two cases is that a pathologic condition of the skin has been proved to have a causal relationship with a serious endocrine disturbance

In a case reported by Lisser (64) onychauxis had developed in a man who had lost the gonads in an accident and developed a eunuchoid syndrome The condition of the nails was greatly improved after the grafting of testicular tissue

Wirtschafter and Littman (304) report transverse furrows of the nails as frequent occurrence in diabetics especially those whose carbohydrate metabolism is not under medical control The thumb index and great toes were more frequently affected

F C Combes (67) has reported the case of a boy aged twelve who presented dystrophies associated with Froelich s syndrome The nails were hypertrophic fissured opaque and brittle The toe nails were similarly affected and there was hyperkeratosis of the palms and soles The basal metabolic rate was minus 21 Haxthausen (232) has reported a similar case in a boy of thirteen suffering from dystrophia adiposo genitalis All nails of fingers and toes were greatly thickened yellow or brown in color and there was also inflammatory paronychia Examinations for fungi were negative and the B M R was normal

Maire and Woringer (75) have reported a case of koilonychia cured by pluriglandular therapy

Dystrophies of the nails have also been reported in cases of parathyroid insufficiency In these cases the administration of calcium lactate and Vitamin D may be indicated (187)

Fox (217) has reported on a large series of cases of onycholysis improved or cured with thyroid medication

We have succeeded in improving cases of partial onycholysis with a normal basal metabolic rate using small amounts of thyroid extract (0 065 gms) administered once a day These cases are usually observed in young women

Chapter VI

CONGENITAL AFFECTIONS OF THE NAILS

CONGENITAL ECTODERMAL DEFECT

Congenital ectodermal defect consists of a fault of development of the external layer of the blastoderm as a consequence of which all the structures developed from this layer are defective The skin in general, the hair, the teeth the mucous membranes of the mouth and the nails are under developed in these cases

The patients have squamous, atrophic skins with little or no sebaceous and sweat secretion, the hair is sparse, dry and brittle, the teeth are separated and imperfect and the nails are usually more or less friable, thin, atrophic and affected with diverse dystrophies

In a case presented by one of us before the American Dermatological Association in 1932, the nails of all the fingers and toes were represented by irregular strips of gray color adherent to the nail bed and the peri ungual tissues by irregular synechiae Some nails were heaped up toward the center of the plate and none had a free border Others were mere stumps situated in the proximal end of the nail bed while the rest of the phalanx was covered by thickened epidermis The patient had universal alopecia, persistence of the first dentition, very scant perspiration, extreme vagotonia and hypertrophic lingual papillae No other members of the family were affected

Congenital ectodermal defects are not common but a number have been reported in the literature At times the condition is familial and hereditary

Anderson (125) has reported a family in which the grand father the mother and two children were affected The nails were apparently normal and smooth at the base but at the free edge were elevated by yellowish dark horny masses All the subjects had been born with erupted teeth and there was no history of syphilis or of any other systemic disease

J A Pires da Lima (126) has reported a case of familial onychatrophia transmitted through the female line The first two patients were twin sisters one of whom had a normal son and three daughters suffering from onychatro phia The nails presented deep lateral depressions and longi tudinal ridges and the free border was thin corrugated and irregular Some nails were reduced to pieces of corneous layer and the rest of the ungual bed was covered with thin epidermis Both finger and toe nails were affected There were no stigmata of degeneration and all patients had normal intelligence

Cole Rauschkolb and Toomey (127) have reported an interesting case under the title of *Dyskeratosis Congenitalis with Pigmentation Dystrophia Unguis and Leukokeratosis Oris* in which all finger nails were affected The base of the nail merged gradually into the skin without definite line of demarcation the nail plates were small and only the nail of the small finger was rather thickened Toward the distal end the nail substance was raised forming a sort of pyramid and there was no free border the nail merging gradually into the skin of the finger tip The nails also presented longi tudinal ridges and grooves some of which split the nail The third nail of each hand had almost disappeared The nails of the toes were less affected and those of the great toes were practically normal

Wise (305) has also reported a case of a similar condition with poikiloderma like changes in the skin cyanosis of the hands and pyorrhea with loss of the teeth the nail plates except that of the right middle finger were almost destroyed and the remnants were thinned dystrophic and ridged in linear formation

Garb and Dubin (306) have published other cases of this type in two brothers who also presented mental backward ness and a condition of the skin of the hands resembling acrodermatitis chronica atrophicans Improvement was noted after the use of injections of testosterone propionate and of large doses of vitamin B complex

Dabney Moon Adams and M H Slatkin (419) report familial pigmentation with dystrophy of the nails in two sisters and a female cousin The finger and toe nails in these cases were brittle atrophic longitudinally furrowed with broken and frayed edges and bases which appeared to merge into the paronychium without the normal demarcation line Extensive and deep skin and mucous brownish to black pigmentation since early childhood was also present Histo *pathologic studies of skin sections revealed a mild compact* hyperkeratosis accentuated around the follicles and slight acanthosis The malphigian and basal layers showed in creased pigment concentration

R T Brain (128) referred to the case of a young woman who had been born without hair on the scalp and eyebrows and had very little pubic hair The nails of the fingers and toes were very thick discolored and beak like and there was great sub ungual *hyperkeratosis This patient also had* congenital hyperkeratosis of the palms and soles

A M Hill (129) has reported the case of a child six years old with downy hair dry and without pigment The patient had two cone shaped teeth set wide apart in the upper jaw but no teeth in the lower jaw Perspiration was absent

The finger and toe nails were of normal shape but dry and brittle and some of them fell off repeatedly as a consequence of recurring superficial paronychia

Goeckerman (130) has reported a case of congenital ecto dermal defect in which the nails of the fingers and toes presented very fine longitudinal parallel ridges and grooves The patient, a woman aged twenty one also had alopecia totalis, absence of the teeth of the lower jaw and only a few stumps in the upper jaw No other member of the family was affected

MacKee and Andrews (131) have reported the case of a boy aged fourteen of Jewish race whose nails were flat, with free lateral borders, that is, that they were on the level with the skin instead of being embedded in the lateral grooves No other member of the family was affected Of eight cases found in a search of the literature by MacKee and Andrews, four presented dystrophies of the nails, three had apparently normal nails and in one case the condition of the nails was not stated

A W Jacobsen (132) has reported two cases of a familial hereditary dystrophy The nails were atrophic ridged, raised from the nail bed, without free edge and brownish or black in color The toes were similarly affected but the great toe nails were hypertrophic Of sixty four members in five gen erations twenty two were affected, both males and females being afflicted with the condition and were capable of trans mitting it to their offspring, but in no case had a non affected person transmitted the condition to his children All persons that had the defect when crossed with normals gave a mixed progeny Thus the character behaves according to Jacobsen, as a Mendelian dominant not sex linked The condition proved intractable

Klauder (133) obtained encouraging results in the treat

ment of defective nails in some cases of congenital dystrophies by means of the internal administration of hydrolized wool This is administered in doses of two teaspoonfuls three times daily to adults and one teaspoonful three times daily to children The treatment should be continued for *at least three months* In Klauder's cases although there was clinical improvement the nails did not become quite normal In other cases there was no apparent clinical improvement although the percentage of sulphur in the nails became higher

H B Thompson (133) reported a family tree of sixty five subjects in four generations of which sixteen were affected eleven males and six females In his cases roentgen ray treatment seemed to be of some help

Norman Tobias (134) has also reported a family tree of dystrophic nail cases in which twelve cases were found among twenty five persons in four generations

Clouston (135) has presented an analysis of one hundred and nineteen cases in six generations of this well marked and easily recognized condition of the nails He concludes as does Jacobsen that this dystrophy follows the law of Mendelian hybrids not sex linked being a dominant defect

According to Clouston there are more than 6 000 cases of this type in America The dystrophy tends to diminish in succeeding generations both as to incidence and severity Every stage of transition may be seen Familial dystrophy of the nails without cutaneous or hair dystrophy is considered *to be a mild expression of congenital ectodermal defect*

Congenital alopecia with atrophy of all the nails has been reported by Traub (307) in a woman aged twenty eight who had the condition since birth and also had moderate hyper keratosis palmaris et plantaris Her family tree traced for six generations showed twenty members thus affected This con dition is common among French Canadians Traub considers these cases as a variety of congenital ectodermal defect

Wilkey and Stevenson (308) reported a nail dystrophy coincident with alopecia in some of the cases, in sixty four of two hundred and sixty five members of six generations of a family of French Canadians The nails were affected in different manners, in some they were smaller and more convex transversally than normal nails and there was some degree of onycholysis in others the nails were slightly thickened and showed longitudinal striations ridges and grooves with the free edges of the nail plates irregularly convex and flat against the nail bed Finally in other members of the family, the most common dystrophy consisted of great thickening of the nails which at the same time were set at an angle, so that the free edges of the nails were raised with accumulations of corneous material underneath All the nails were discolored



Fig 109 Dystrophies of the nails in a case of congenital ectodermal defect The patient had no hair sweat secretion was very scanty and there was leukoplakia of the tongue The teeth were missing

Involvement of the supra renals is suspected in some cases because of symptoms resembling those of Addison s disease in its earlier stages Involvement of the anterior lobe of the pituitary is held responsible for certain features suggestive of those found in acromegaly

Garb (309) has reported a case of congenital ungual dystrophy with pigmentation and leukoplakia in which there was evidence suggestive of Addison s disease

Berta Aschner (171) and J W Turner (172) in 1933 *called attention to a congenital syndrome consisting of* (1) disorders of the nails varying from slight thinning to complete anonychia affecting more severely the thumb nails and becoming less marked toward the little finger (2) hypo plasia of the patella and internal condyle of the femur and (3) deformities of the elbow and of several other bones These congenital anomalies seem to be due to the presence of abnormal genes in the same or neighboring chromosomes in the ovule Montant and Eggermann (233) have reported a group of similar cases with dystrophic nails The patients *were exclusively blonds of either sex with light blue eyes*

H R and B D Senturia (310) have reported a case of this type of congenital defect in a family containing thirty persons similarly affected in four generations

The diagnosis of congenital ectodermal defect should never be definitely made in cases where the nails alone are in volved, unless syphilis ringworm and hypothyroidism have been ruled out

ANONYCHIA

Total absence of the nails is occasionally observed at birth This anomaly may be permanent or more or less dystrophic nails may grow later in life At times also the patient is born with defective nails which are finally shed and no new nails grow in their place This is a rare anomaly

Anonychia has been observed in congenital ichthyosis or harlequin fetus

O Neill (136) has reported the case of a patient who had no nails at all on the fingers and only small fragments on the toes The fingers had a hooded appearance the nail beds were present and had a shiny reddish vascular proximal end corresponding to the atrophied or underdeveloped matrix Two other sisters were similarly affected

Berge and Weisenbach (137) have reported the case of a woman thirty seven years old who was born without finger nails The patient was apparently normal although of neurotic tendencies and her only child had normal nails In this case the epidermis of the nail bed had a resemblance to that of the normal nail but the tissue formed was common epidermis and not nail Histologically there was absence of the matrix

Listengarten (138) has reported a case with absence of finger nails and toe nails from birth The nail bed remained



Fig 110 Polydactylia Two separate nails on the same toe but the toe had separate phalanges This type is also called polyonychia (Courtesy of Dr Oswaldo G Costa)

and roentgenograms showed no bone changes No other members of the family were affected

Hypoplasia of the nails and rudimentary nails were reported in two sisters with congenital cataract and congenital ectodermal dysplasia by Cole, Giffen and Stroud (311)

POLYDACTYLIA AND SYNDACTYLIA

In cases of supernumerary fingers or toes the nails may be missing or may be atrophic Sometimes there may be two nail plates joined by their roots and matrices as in syndactylia or there may be two nails from one single matrix Two nails entirely separate from each other may exist on the same finger or toe (polyonychia) In polydactylia small minute nails may be implanted on the supernumerary fingers or toes



Fig 111 Polydactilia Two nails developing on the thumb joined by their roots The thumb had a double phalanx

Edmond Fournier (139) considers syndactylia and poly dactylic as teratologic stigmata of congenital syphilis In one of his cases the child had total syndactylia of the last four fingers of each hand forming a single mass surmounted by one nail The toes were also massed together and the nails

were adjoining in such a manner that they looked like a single nail divided into five parts by longitudinal sulci The child had been born dead and had many other stigmata of congenital syphilis

ONYCHOHETEROTOPIA

This anomaly consists of the presence of abnormally situated nails, as for example on the palmar or dorsal surface of the finger or toe and on their lateral aspects This is more frequent in the little finger and as a rule the condition is symmetrical In these cases there may be an abortive degree of syndactylia

MICRONYCHIA AND MACRONYCHIA

Micronychia consists of the presence of one or more small nails which in every other respect seem normal As a rule these nails are thin and wide They may be *no* more than two or three millimeters in diameter We have seen a case of symmetric micronychia of both thumbs in a white woman



Fig 112 Micronychia of the thumbs in a middle aged woman

aged thirty eight All other finger and toe nails were normal There was no disturbance of the ductless glands or any other congenital anomaly

In macronychia the nails are normal in shape and texture but are abnormally large Sometimes their curvature may be slightly exaggerated These cases are rare and as a rule are observed in cases of macrodactylia or in gigantism or acromegalia

CONGENITAL PACHYONYCHIA

Under this name Jadassohn and Lewandowsky (110) reported a case of hypertrophy and thickening of all nails of fingers and toes coincident with disseminate keratosis follicularis palmar and plantar hyperkeratosis and leukokeratosis of the tongue The nails of all toes and fingers were enormously thickened and hard with elevated free borders They were brown in color and covered with numerous longitudinal striations The patient also had hyperhidrosis of the extremities

Howard Fox (141) has reported the case of a normal child three years and nine months of age in which all finger and toe nails were affected The nails were greatly thickened particularly toward the free edge the surface of the nail plates was smooth and their color was brown There was no paronychia The arms and legs were covered with follicular keratoses and verrucous formations

This patient was seen again by Fox sixteen years later, the clinical picture remaining unchanged The patient was then a vigorous looking man aged twenty in good health His chief complaint was the appearance of blisters after walking or excessive sweating (312) Sohrweide (181) in reporting a case of this type in a boy aged eight, advances the opinion that arsenical retention and endocrine dysfunction may be factors in aggravating this condition In his

case arsenic was present in small amounts in the blood and in the urine

Heller includes these cases of pachyonychia among the congenital dyskeratoses According to Andrews and Ab shier (182) pachyonychia may in many ways represent added manifestations of Darier s disease Fox (238) has reported in 1939 a very typical case of pachyonychia in a girl nine years of age The patient was the only member of a family of ten children affected by this condition Changes of the nails were *noticed at the age of six months coincident with* verrucous formations and bullae scattered over the skin

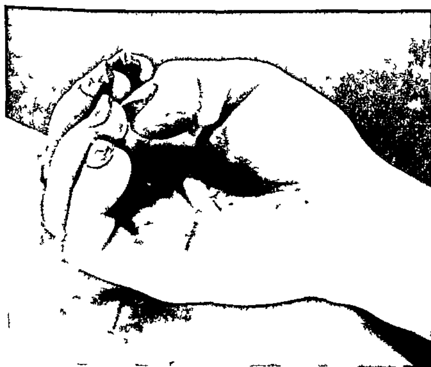


Fig 113 Pachyonychia assoc ated v th keratos s palmaris hereditaria

Leukokeratosis of the mouth was also present All nails of fingers and toes were greatly thickened and grew upward at an angle of forty five degrees, the length varying from one half to one inch The color was brownish black There was no paronychia

Although most cases of pachyonychia seem to be congenital, we have observed two cases of uniform hypertrophy of all finger and toe nails, with plantar and palmar hyperkeratosis, which developed late in life In both cases the nails were horny, brown in color and caused no subjective sensations Follicular hyperkeratoses and desquamation were present in one case Chronic eczema of the hands was present in the other case In spite of thorough examination no apparent cause was found for the condition in these cases Hypovitaminosis was suspected in one case, but the patient passed from observation and the results of high vitamin diet and medication could not be recorded

In some cases pachyonychia of all fingers and toes may be present from birth without any other skin symptoms (190)

Sertoli (450) under the term 'Dysonychia Hereditaria Familiare" reports a familial incidence in the daughter, father, uncle (father s brother) grand father and great grand father of onychogryphosis of all the finger and toe nails with palmar and plantar hyperkeratosis associated in the adult members of the family with multiple sebaceous type cysts dissemminated over the trunk According to the authors these sebaceous-like cysts resemble Sebocystomatosis of Bosellini and Pringle

Treatment is usually without effect in cases of pachyonychia, but Tauber claims that injections of cystine improved the cutaneous condition of one of his patients This case was reported in full by L C Goldberg (234)

Pachyonychia congenita treated with massive doses of

vitamin A and wet dressings of buffered cysteine hydrochloride seemed to improve in a patient of Wright and Guequierre (339) In one case excellent functional results followed the amputation of all the ten terminal phalanges of the fingers

Mullins (451) claims good results on functional bases with hypnosis" in the treatment of pachyonychia congenita in an eleven year old child

Garb (345) has reported great improvement in two cases of pachyonychia congenita with disappearance of calluses and bullae, after using especially fitted shoes with rubber base foot molds The patients were able to walk in comfort with these shoes

INCONTINENTIA PIGMENTI (BLOCH SULZBERGER)

This rare congenital condition described by Bloch and Sulzberger (235) consists of pigmentary patches irregularly distributed on the skin, faulty dentition, dystrophies of the nails, patchy alopecia and ocular disturbances A number of cases have been reported up to date In one American case observed, Sulzberger reports the following nail disturbances 'all the nails of the fingers were affected They were thinner than normal flattened and spoon shaped and presented slightly yellow discoloration and both longitudinal and transverse shallow, depressed striae The nails were brittle and friable, and some were irregularly broken off at the free margins This condition seems to be a type of congenital ectodermal defect familial and hereditary

NEVUS STRIATUS SYMMETRICUS UNGUIS

Under this name Oliver and Bluefarb (313) have reported the case of a girl aged twelve who had a dystrophic condition of the thumbs and little nails since the age of six No other member of the family was affected nor was there any history

of any previous case The toe nails were not involved The affected nails showed atrophic ridges in the center, depressed below the surface of the nail plates the little fingers showed parallel dark lines in the center of the nail plates The authors consider the condition nevoid

Oppenheim and Cohen (311) have reported the case of a woman aged thirty eight whose condition had been present since birth In the center of the nails there were lineal areas 3 mm wide by 13 mm long These areas were composed of parallel short lines of dark color which extended from the posterior nail fold to the free edge and were depressed in regard to the surface of the nail Only the thumbs were affected No other members of the family showed any changes

Chapter VII

THE ROENTGEN RAY TREATMENT OF DISEASES OF THE NAILS

One of the most useful agents at our disposal for the treatment of diseases of the nails, is the roentgen ray It offers a clean, convenient and often quickly successful therapeutic method, which may be used with advantage in a number of nail affections

As a rule fractional doses of from 75 to 150 r unfiltered, at weekly or fortnightly intervals, are sufficient Sub intensive or intensive doses are sometimes necessary Some radiotherapists prefer the larger doses at longer intervals, with or without filtration No more than eight or ten fractional or two or three intensive doses should be applied Chronic radiodermatitis of the posterior nail wall and of the adjacent skin of the fingers, and atrophy of the matrix, may result after prolonged exposures or repeated small doses even in cases in which no erythema was discernible at the time of the treatments Shielding of the matrix is not necessary when fractional doses are used, but it should always be done when intensive treatment is attempted Shedding of the nails has been observed after intensive irradiation, but this should never be attempted as a therapeutic procedure

The mode of action of the roentgen ray has not been satisfactorily explained It probably acts, as it does in many chronic skin diseases, by improving the local nutrition of the cells and tissues and bringing about a better local physiological function It has been proved that the roentgen rays have no parasiticide or antiseptic properties

The onychomycoses, several dystrophies, psoriasis, eczema, erruca vulgaris and inflammatory paronychia respond well) the roentgen rays in many cases Some cases of moderate nychauxis may also be improved or even cured by irradia on Atrophic conditions of the nails should not be treated i this manner

Irradiation is a method widely used in the treatment of soriasis of the nails, although some cases prove very stub orn Weekly doses of 75 "r" units for six to eight con cutive weeks are usually required, if this number of treat- ents do not bring about the desired results, the method iould be abandoned The skin surrounding the nail plates ust be carefully protected with lead foil Unfiltered radi ion is used in these cases In case of relapse one more urse of treatment may be employed provided that at ast a year has elapsed since the previous treatment Further ray administration is dangerous and may cause severe rophy due to radiodermatitis

In the treatment of verrucae of the nail fold or of the nail d it is advisable to remove as much of the nail plate as ssible to expose the lesion When the verruca surrounds e nail as it often happens, it is advisable to treat both sides parately placing the finger flat on its side at an angle of degrees, the skin of the finger being protected with lead l The first application may consist of 300 to 600 r its according to the size of the growth After three weeks e verruca should be gone Otherwise a second application iy be used but if this fails, the lesion should be removed other therapeutic procedure When the verruca is well nited a localizer should be used In these cases unfiltered liation is also used

Ringworm of the nails is a most obstinate and rebellious ection, resistant at times to all forms of treatment The ults obtained by irradiation are sometimes brilliant some

times entirely disappointing Hazen (151) states that only 10 per cent of his cases were cured MacKee (152) reports eighteen cures out of a total of thirty cases

MacKee (152) states that nails infected with microsporum gypseum yield better to roentgen ray treatment than those infected with Trychophyton purpureum From 3 to 10 x ray treatments may be used before improvement

Roentgen ray treatment of onychomycoses is now obsolete The use of Griseofulvin by oral administration, one gram daily for one to four months, according to the extent of the parasitized nail tissue, has resulted in a successful therapeutic method, in almost 100 per cent of the affected nails Some nails may be deformed when the disease has been of long standing and the nail root and periungual tissues have been affected in their anatomical structure These cases are really due to the chronic inflammation and atrophy in onycho mycoses of long standing Roentgen ray treatment may be of some help in these cases

The treatment with Griseofulvin must be prolonged as long as the nails show any trace of parasitic condition, since Griseofulvin is a parasitostatic and not a parasiticide

Chapter VIII

OCCUPATIONAL AFFECTIONS OF THE NAILS

Occupation	*Nail Symptoms*	*Cause*
Bottlewashers	Onycholysis paronychia	Trauma water alkalies
Bakers	Paronychia	Flour baking powder
Bartenders	Paronychia	Water soap maceration
Batteries (electric)	Paronychia	Sulfuric acid
Bricklayers	Paronychia Hangnails	Lime cement mortar
Beauticians	Paronychia	Shampoo dyes alkalies
Bookbinders	Paronychia	Paste
Brewers	Onycholysis	Cleaning yeasts casks
Butchers	Paronychia	Bristles of cattle
Button makers	Paronychia and vesicular dermatitis	Injuries
andy dippers	Paronychia	Sugar
ement workers	Paronychia loss of nails hangnails	Cement
igar makers	Onycholysis stains dermatitis	Mechanical tobacco juice glue
hemists	Paronychia onychorrhexis brittle nails	Chemicals
himney sweeps	Koilonychia	Trauma
hromium workers	Ulcers	Chromium salts and acids
onfectioners	Onycholysis paronychia	Sugar fruit juices
ooks	Paronychia	Soap water maceration
osmetics workers	Paronychia	Dyes chemicals acetone potash
entists	*Onychorrhexis dermatitis*	Plastics, anaesthetics

Occupation	*Nail Symptoms*	*Cause*
Dishwashers	Paronychia	Soap detergents water grease
Dyers	Paronychia stains necrosis	Anilin dyes
Engravers	Paronychia brittle nails	Chemicals
Etchers	Paronychia brittle nails stains	Chemicals
Farmers	Onycholysis onychomycosis paronychia	Dirt trauma fungi
Fishermen	Paronychia	Water scales hooks
Fruit canners	Paronychia onycholysis	Yeasts fruit juices
Galvanizers	Dark blue pigmentation ulceration	Silver cyanides
Glass etchers	Paronychia brittle nails soft nails onychomadesis	Hydrofluoric acid
Glass workers	Koilonychia	Mechanical
Glaziers	Paronychia brittle nails	Acids
Grocers	Paronychia	Sugar flour
Hat cleaners	Paronychia brittle nails	Oxalic acid cleaners
Houseworkers	Paronychia onycholysis	Soap water cleaners polishes
Laboratory workers	Brittle nails onychorrhexis	Formalin acids, alkalies
Laborers	Onychia paronychia	Trauma dirt fungi
Laundry workers	Paronychia onycholysis	Soap water lime starch detergents
Lead workers	Onychomadesis leukonychia onychalgia	Lead poisoning
Mechanics	Onychia paronychia	Trauma greases
Milkers	Onycholysis cow pox	Bristles cow pox virus
Miners and mechanical hammerers	Onycholysis hyperkeratosis subungualis onychalgia	Trauma
Nurses	Paronychia discoloration onychorrhexis chancre	Chemicals disinfectants syphilis
Orthopedists	Onychorrhexis brittle nails	Plaster of Paris
Painters	Paronychia brittle nails	Paints dyes turpentine
Pastry cooks	Paronychia	Sugar flour fruit juices

Occupation	*Nail Symptoms*	*Cause*
Photographers	Paronychia brittle nails discoloration	Chemicals
Physicians	Paronychia hyperkeratosis subungualis onychorrhexis chancre	Chemicals disinfectants anaesthetics syphilis
Porcelain workers	Brittle and serrated nails	Pouring glass
Radio workers	Paronychia and nail loss	Methyl alcohol
Radium technicians	Atrophy, radium dermatitis white bands	Radiation
Salt workers	Paronychia and ulcers	Salt and brine
Shellers of beans and potato peelers	Paronychia and atrophy	Mechanical
Silk workers	Chronic paronychia	Trauma silk threads
Shoe workers	Paronychia brittle nails	Chemicals
Tanners	Panaritium paronychia pigeonneau of the French	Tannin sodium protosulfide lime chrome salts bacterial infection
Textile workers	Paronychia necrosis	Threads of tissues
Treers (shoes)	Paronychia onycholysis	Ether naphtha dyes benzene trauma
Violinists	Dystrophy atrophy paronychia	Trauma
Wood workers	Paronychia brittle nails stains	Oxalic acid tannic acid shellac trauma
Wool workers	Paronychia panaritium	Wool threads
Gardeners	Onycholysis onychomycosis paronychia	Dirt trauma fungi

OCCUPATIONAL STIGMATA OF THE NAILS

Burnt sugar workers	Brown discoloration
Chrome salts	Ochre pigmentation
Cigarette makers	Wearing down the nails and thickening of ungual phalanx
Coffee roasters	Brown discoloration
Confectioners	Erosions and fissures around the nails flattening of finger tips like spatula

Dinitrotoluene	Yellow stain of the nails
Dyestuffs	Stains nails and hands according to color, brittle nails atrophic and flexible nails
Ebony workers	Dark yellow or black discoloration under the nails
Glaziers	Softening of the nails and retarded growth
Gunmakers	Black discoloration under the nails
Hatters	Yellow spots
Indigo	Women employed in shelling indigo develop exceptionally long right thumb nail
Joiners	Discoloration of the nails due to polish
Lace makers	Overdevelopment of left index finger nail shortened nail of the right index finger
Mercury workers	Beau s lines and black and brown stains
Munition workers	Wearing down of the edges of the nails of the 3rd & 4th fingers from removing cartridges and capsules
Onychopathomimia	Simulation of illness in reference to the nails to claim compensations
Packers	Excavation under the free borders of the nails of last 3 fingers of both hands from folding paper
Photographers	Brown stains from methol
Picric acid	Yellow discoloration
Platers	Corroded nails from plating solution
Rope workers	Left thumb nail larger and thicker than right free nail borders irregular due to friction
Silver workers	Slate blue discoloration
Thallium	Transverse white bands
Washerwomen	Onycholysis partialis
Watchmakers	Hypertrophied thumb nails from opening watches
Silk weavers	Japanese women engaged in an ancient art in Kyoto and Osaka The free borders of the finger nails dented by a fine file work so that they resemble a saw a rake or a comb

Consult References (315 316 317 452 453)

Chapter IX

UNGUAL SYMPTOMS DUE TO DRUGS AND POISONS

Acetanilid. All anilins or drugs of this type may produce purple discoloration of the nails, a sign of intolerance and of poisoning A very early symptom Acetanilid is the active ingredient in many of the sedatives powders and other pro prietary preparations

Acetylsalicylic Acid. Sub ungual purpura has been reported as a sign of poisoning by acetylsalicylic acid (aspirin).

Anilin Poisoning. Persistent bluish violet discoloration of the nails and cyanosis has been observed in cases of poisoning with shoe polish (liquid) and other chemicals containing anilin dyes

Arsenic. After acute as well as in the course of chronic arsenical poisoning the following nail symptoms have been reported onychomadesis, leukonychia striata, transverse white bands (Mee s stripes), melanosis, Beau's lines, paronychia sicca In dermatitis due to arsenicals paronychia and Beau's lines are very common and in the end onychomadesis may occur, especially of the finger nails

Atabrine. (Quinacrine hydrochloride) The numerous cases of dermatitis due to this drug which occurred in the Pacific islands among the soldiers of the U S Army, have been fully reported in the dermatological literature under the names of 'Atypical lichen planus,' Lichenoid dermatitis" and others The nails are usually affected and often their changes persist long after the dermatitis has receded Schmitt, Alpins,

and Chambers (318) reported alopecia totalis and loss of all nails in two of their cases of this condition, other patients lost a few nails, the toe nails were seldom affected In cases of erythroderma due to quinacrine hydrochloride, paronychial involvement usually took place and was invariably followed by disturbances of the nails in the form of deep cross ridging or of tremendous piling up of the nail substance, with loosening of the nail plates

Bereston (319) reports that about 30% of the cases of dermatitis caused by quinacrine hydrochloride, had varying degrees of nail changes Some or all the finger and toe nails showed degenerative changes such as white, yellow or gray discoloration, pitting, shedding of the nail plate, crumbling of the superficial layers of the nails and other minor disturbances

Lutterloh and Shallenberger (320) report blue-gray and slate colored pigmentation in the finger and toe nails in eight patients who had been taking quinacrine hydrochloride for several months The pigmentation affected the nail bed and was either diffuse or in the form of transverse bands near the middle of the nail These patients also had pigmentation of the skin and of the mucous membranes

Butler (321) in reporting cases of Atypical lichen planus tropicalis states that the nails are commonly involved, showing thickening, distortion and loss of nails in a few instances The regrowth of hair and the return of the nails required an interval of several months

An interesting phenomenon has been reported by several observers, the peculiar fluorescence of the nails in cases that have been taking quinacrine hydrochloride (322 323) These nails show a greenish yellow fluorescence all the way to the cuticle Those patients who had been taking atabrine for a month or less showed only the normal pearly white fluorescence on the proximal parts of the nails, while the distant

portions showed the greenish yellow fluorescence typical of atabrine The total disappearance of the drug from the nails, judging from the *presence of the fluorescence phenomenon,* took from 4 to 6 months, the thumb and index finger being those which showed the fluorescence longest In the feet, the great toe nail was the longest affected The fluorescence appears only after sufficient quinacrine hydrochloride has been administered, small amounts cause no fluorescence The phenomenon persisted from five to twenty one months *in the cases reported*

A case of atabrine dermatitis was seen by one of the authors of this book four years after recovery, in a former U S soldier who had seen prolonged service in New Guinea The skin was somewhat atrophic and discolored in some places and all the finger nails were short, covered with depressed puncta, longitudinally striated (onychorrhexis) scaly and discolored *The patient was in good health There was no* fluorescence of these nails The toe nails were similarly affected

Emetine Emetine as used in amebic disentery produces a branny desquamation of the skin and an atrophic, brittle condition of the nails in some cases, according to Manson (294)

Gold Brownish black *discoloration, Beau s lines and re* tarded growth have been reported after dermatitis due to gold salts or after prolonged courses of treatment with gold salts

Lead. In chronic lead poisoning onychomadesis, atrophy of the nails, onychorrhexis and slow growth have been reported

Neo synephrine (I evo meta hydroxy phenyl ethanol meth ylamina *hydrochloride) used locally for colds has caused in* some cases purpura of the nail bed

Silver. Silver salts organic and inorganic, such as silver proteins, silver nitrate and other proprietary preparations

used to be frequently employed for many months and even years in the prevention and treatment of nose and throat infections and for other minor local infections In many cases argyria developed and nail symptoms were common, such as slate blue discoloration caused by the deposit of metallic silver in the nail bed, the matrix and the nail wall, but not in the nail substance itself This discoloration is permanent

Sulfa Drugs Dermatitis caused by sensitization to the sulfa drugs, activated often by exposure to the sun rays, may cause extensive and serious dermatitis Nail symptoms are common, such as onychomadesis, paronychia, Beau's lines and retarded growth of the nails Finger nails are more often affected than toe nails

Thallium Thallium has been used in the treatment of ringworm of the scalp but has been almost abandoned due to its high toxicity Most cases of thallium poisoning occur accidentally Transverse white bands of the nails and defluvium capillorum are common symptoms of poisoning by thallium salts

Trinitrotoluene (T N T) Produces in workers in ammunition factories chronic poisoning with abdominal pains, anemia frequent emesis cramps and in some cases serious blood dyscrasia, nail symptoms have been observed usually purpura of the nail bed

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